

DOCUMENT RESUME

ED 079 157

SE 016 545

AUTHOR Warpinski, Robert
TITLE A Supplementary Program for Environmental Education, Mathematics, Grade 5-6.
INSTITUTION Project I-C-E, Green Bay, Wis.
SPONS AGENCY Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE 72
NOTE 75p.
EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS Behavioral Objectives; *Elementary Grades; *Environmental Education; Fundamental Concepts; Grade 5; Grade 6; Instructional Materials; Interdisciplinary Approach; Learning Activities; *Lesson Plans; *Mathematics; *Teaching Guides
IDENTIFIERS ESEA Title III

ABSTRACT

Presented in these teacher's guides for grades five and six are lesson plans and ideas for integrating mathematics and environmental education. Each lesson originates with a fundamental concept pertaining to the environment and states, in addition, its discipline area, subject area, and problem orientation. Following this, behavioral objectives and suggested learning experiences are outlined. Behavioral objectives include cognitive and affective objectives and skills to be learned, while learning experiences list student-centered in-class activities and outside resource and community activities. Space is provided for teachers to note resource and reference materials--publications, audio-visual aids, and community resources. The guides are supplementary in nature and the lessons or episodes are designed to be placed in existing course content at appropriate times. This work was prepared under an ESEA Title III contract for Project I-C-E (Instruction-Curriculum-Environment). (BL)

ED 079157

Project I - C - E

INSTRUCTION - CURRICULUM - ENVIRONMENT

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 5

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
1927 Main Street
Green Bay, Wisconsin 54301
(414) 432-4338
(after Dec. 1, 1972 - 468-7464)

Robert Warpinski, Director
Robert Kellner, Asst. Dir.
George Howlett, EE Specialist

U.S. DEPARTMENT OF
EDUCATION
THIS DOCUMENT
CONTAINS EXACT
REPRODUCTIONS OF
THE PERSON OR
ATING IT. POINT
STATED DO NOT
SENT OFFICIAL
EDUCATION FOR

SE 016 545

E INSTRUCTION - CURRICULUM - ENVIRONMENT

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

PROGRAM FOR ENVIRONMENTAL EDUCATION

Mathematics GRADE 5

Title III E.S.E.A.

in CESA's 3-8-9

onsin 54301

1972 - 468-7464)

Robert Warpinski, Director
Robert Kellner, Asst. Director
George Howlett, EE Specialist

PREFACE

"Oikos" for house is the Greek origin of the term "ecology". studies our house--whatever or wherever it may be. Like an unbounded space, it can expand or contract to fit many ranges--natural and man-made. We live in many environments, our many "houses" if we omit rancor and cite long-term complexities. Our "oikos" uses the insights of all subjects. A multidisciplinary program like ours necessarily results. Also, over a long time, our program ranges K thru 12. The environment mirrors our values. These values have their origin in the "oikos" of our common minds. Let us become masters of our house by replacing the Greek word with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is intended to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your students, you can choose to adapt or adopt. Limitless chances are here for your experience. Many episodes are self contained, some open-minded, still others developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no guide and no curriculum will work unless viewed in the context of your own school.
4. React to this guide with scratch ideas and notes on the episodes.
5. After using an episode, fill out the attached evaluation form to duplicate, or request more of these forms. Send them singly or in bulk. We sincerely want your reactions or suggestions--negative and positive. Evaluations are the key in telling us "what works" and in aiding the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all school districts in CESA 3, 8, and 9. Check the Project ICE Bibliography for resources. Our address and phone number is on this guide's cover or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Avenue, Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or process.
Affective refers to student attitudes, values, and feelings.

PREFACE

"s" for house is the Greek origin of the term "ecology". Environmental education is our house--whatever or wherever it may be. Like an umbrella, our house can expand or contract to fit many ranges--natural and man-made. We can add quality to our programs, our many "houses" if we omit rancor and cite long range gains, costs, and realities. Our "oikos" uses the insights of all subjects. Thus, a rational, positive, interdisciplinary program like ours necessarily results. Also, since attitudes grow over time, our program ranges K thru 12. The environment mirrors our attitudes or

These values have their origin in the "oikos" of our collective and individual. Let us become masters of our house by replacing the Greek adage of "Know thyself" with "Know thyself and thine house."

Written and designed by your fellow teachers, this guide is supplementary in nature--it fits appropriately into existing, logical course content.

Each page or episode offers suggestions. Knowing your students best, you decide what to adapt or adopt. Limitless chances are here for your experimentation and usage.

Some episodes are self contained, some open-minded, still others can be changed or developed over a few days.

Use these episodes, but please pre-plan. Why? Simply, no guide has all the answers, and no curriculum will work unless viewed in the context of your students.

Refer to this guide with scratch ideas and notes on the episode pages.

For using an episode, fill out the attached evaluation form in the back. Use, duplicate, or request more of these forms. Send them singly or collectively to us.

We sincerely want your reactions or suggestions--negative and positive. Your evaluations are the key in telling us "what works" and in aiding our revisions of the guides.

----- AND ABBREVIATIONS

UMC is Project ICE Resource Materials Center serving all public and non-public school districts in CESA 3, 8, and 9. Check the Project ICE Bibliography of available resources. Our address and phone number is on this guide's cover. Feel free to write to us for any materials or help.

Wisconsin Bureau of Audio Visual Instruction, 1327 University Avenue, P. O. Box 2093, Madison, Wisconsin 53701 (Phone: 608-262-1644).

Attitude means a measurable mental skill, ability, or process based on factual data. Affective refers to student attitudes, values, and feelings.

ACKNOWLEDGEMENTS: The following teachers and consultants participated in the
cf the Supplementary Environmental Education Guides:

CESA #3

D. C. Aderhold, Bonduel
John Anderson, Peshtigo
Walter Anderson, Wausaukee
Bonnie Beamer, Coleman
Merlyn Blonde, Shawano
R. A. Dirks, Gillett
Dennis Dobrzanski, White Lake
LeRoy Gerl, Oconto
Karen Grunwald, St. James (L)
William Harper, Lena
Sister Claudette, St. Charles
Ervin Kunesh, Marinette
Kathleen LeBreck, Oconto
P. E. Lewicki, Gillett
Dorothy C'Brien, Wausaukee
Terry Otto, St. John (L)
Arthur Paulson, Oconto Falls
Marie Prochaska, Lena
Christine Proctor, Wausaukee
Arthur Scheik, Suring
Peter Skroch, Oconto Falls
David Soltesz, Crivitz
Bill Stillion, Shawano
Cathy Warnack, White Lake

Consultants

CESA #3

Dr. Richard Presnell,
Univ. of Wisc.-Greer Bay

CESA #8

Dr. James Marks,
Lawrence University

CESA #9

Dr. Charles Peterson,
St. Norbert College

CESA #8

Mary Anders, Winneconne
Robert Becker, Fox Valley (L)
Mary Chriss, Hortonville
Cliff Christensen, Winneconne
Kenneth Couillard, Hortonville
Raymond Emerich, Hortonville
Mike Ercegovac, Winneconne
Dona Geeding, Menasha
Donald Hale, Winneconne
James Huss, Freedom
Sister Lois Jonet, Holy Angels
Kenneth Kappell, St. Aloysius
Kenneth Keliher, Appleton
Everett Klinzing, New London
Fred Krueger, Oshkosh
Jim Krueger, Winneconne
Mae Rose LaPointe, St. John High
Rosemarie Lauer, Hortonville
Robert Lee, Neenah
Harold Lindhorst, St. Martin (L)
Dennis Lord, Little Wolf
Robert Meyer, Neenah
Arnold Neuzil, Shiocton
James Nuthals, Lourdes
Connie Peterson, St. Martin (L)
Rosemary Rafath, Clintonville
Mark Reddel, St. Martin (L)
Gladys Roland, Little Wolf
Kathryn Rowe, Appleton
Mary Margaret Sauer, Menasha
Edwin Schaefer, Kaukauna
Lee Smoll, Little Chute
Doris Stehr, Mt. Calvary (L)
Ginger Stuvetraa, Oshkosh
Richard Switzer, Little Chute
Tim Van Susteren, Holy Name
Lila Wertsch, St. Margaret Mary
Warren Wolf, Kimberly
Gery Farrell, Menasha

Peter Biol
Lee Clasen
Kathryn Co
Merle Colb
Sara Curti
Duane DeLo
Roberta Di
Janet Elin
Phyllis El
Keith Fawc
Jack Giach
Mike Gleff
Herbert Ha
Gary Heil,
Nannette H
Joseph Huc
Catherine
DeAnna Joh
Kris Karp
Mel Kasen,
Jack Koivis
Sister Mary
Ellen Lotz
Judilyn Mc
Priscilla M
C. L. Pague
William Rob
Roger Rozn
Jan Serrahr
Calvin Sieg
Mary Smith,
Carol Trimb
Mary Wadzin

ing teachers and consultants participated in the development
lementary Environmental Education Guides:

CESA #8

Mary Anders, Winneconne
Robert Becker, Fox Valley (L)
Mary Chriss, Hortonville
Cliff Christensen, Winneconne
Kenneth Couillard, Hortonville
Raymond Emerich, Hortonville
Mike Ercegovac, Winneconne
Dona Geeding, Menasha
Donald Hale, Winneconne
James Huss, Freedom
Sister Lois Jonet, Holy Angels
Kenneth Kappell, St. Aloysius
Kenneth Keliher, Appleton
Everett Klinzing, New London
Fred Krueger, Oshkosh
Jim Krueger, Winneconne
Mae Rose LaPointe, St. John High
Rosemarie Lauer, Hortonville
Robert Lee, Neenah
Harold Lindhorst, St. Martin (L)
Dennis Lord, Little Wolf
Robert Meyer, Neenah
Arnold Neuzil, Shiocton
James Nuthals, Lourdes
Connie Peterson, St. Martin (L)
Rosemary Rafath, Clintonville
Mark Reddel, St. Martin (L)
Gladys Roland, Little Wolf
Kathryn Rowe, Appleton
Mary Margaret Sauer, Menasha
Edwin Schaefer, Kaukauna
Lee Small, Little Chute
Doris Stehr, Mt. Calvary (L)
Ginger Stuvettraa, Oshkosh
Richard Switzer, Little Chute
Tim Van Susteren, Holy Name
Lila Wertsch, St. Margaret Mary
Warren Wolf, Kimberly
Gery Farrell, Menasha

CESA #9

Peter Biolo, West DePere
Lee Clasen, Lux.-Casco
Kathryn Colburn, Algoma
Merle Colburn, Algoma
Sara Curtis, Green Bay
Duane DeLorme, Green Bay
Roberta Dix, St. Joseph Acad.
Janet Elinger, Ashwaubenon
Phyllis Ellefson, Wash. Isle.
Keith Fawcett, West DePere
Jack Giachino, Seymour
Mike Gleffe, St. Matthews
Herbert Hardt, Gibraltar
Gary Heil, Denmark
Nannette Hoppe, How.-Suam.
Joseph Hucek, Pulaski
Catherine Huppert, DePere
DeAnna Johnson, Denmark
Kris Karpinen, West DePere
Mel Kasen, Gibraltar
Jack Koivisto, Green Bay
Sister Mary Alyce, Cathedral
Ellen Lotz, West DePere
Judilyn McGowan, Green Bay
Priscilla Mereness, Wrightstown
C. L. Paquet, Denmark
William Roberts, Sturgeon Bay
Roger Roznowski, Southern Door
Jan Serrahn, Sevastopol
Calvin Siegrist, How.-Suam.
Mary Smith, Green Bay
Carol Trimberger, Kewaunee
Mary Wadzinski, How.-Suam.

C O N C E P T

<u>I. Energy from the sun, the basic</u>	Discipline Area	<u>Mathematics</u>
<u>source of all energy, is converted</u>	Subject	<u>Sun Energy</u>
<u>through plant photosynthesis into a</u>	Problem Orientation	<u>Graph Reading</u>
<u>form all living things can use for</u>		<u>Metric Reading</u>
<u>life processes.</u>		

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The student will read a chart showing daily growth of plants in centimeters. <u>Affective:</u> The student will through verbal action support the proposition that energy from the sun is converted through photosynthesis into a form all living things can use for life processes. <u>Skills to be Learned</u> Reading of Graphs Comparing	I. Student-Centered in class activity (Worksheet graph on reverse side) A. Ask children to look at worksheet graph. Explain that someone did an experiment with pea seedlings to find out how much they would grow each day at a certain temperature. Have them look at 55 degrees on the chart. At 55 degrees the seedling grew 1/2 centimeter each day. Explain that seedlings were also growing at other temperatures. B. Have children graph the information. C. Have children answer various questions using the graph information. - At what temperature did plants grow most? - At what temperature did plants grow least? - Which temperature was the most like a cool day? Like a hot day? - Which temperature was best for plants? - What happened when the temperature was too cold? Too hot? (continued on reverse side) II. Out of Class

from the sun, the basic Discipline Area Mathematics
 all energy, is converted Subject Sun Energy
 plant photosynthesis into a Problem Orientation Graph Reading - Grade 5
 Metric Reading
 living things can use for
 esses.

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
e student hart show- wth of plants s. e student verbal ac- the pro- energy is con- h photo- o a form ings can processes. <u>Learned</u> <u>aphs</u>	I. Student-Centered in class activity (Worksheet graph on reverse side) A. Ask children to look at work-sheet graph. Explain that someone did an experiment with pea seedlings to find out how much they would grow each day at a certain temperature. Have them look at 55 degrees on the chart. At 55 degrees the seedling grew 1/2 centimeter each day. Explain that seedlings were also growing at other temperatures. B. Have children graph the information. C. Have children answer various questions using the graph information. 1. At what temperature did plants grow most? 2. At what temperature did plants grow least? 3. Which temperature was the most like a cool day? Like a hot day? 4. Which temperature was best for plants? 5. What happened when the temperature was too cold? Too hot? (continued on reverse side)	II. Outside Resource and Community Activities

Resource and Reference Materials

Publications:

Conditions Affecting Life

Unit 23 I-C-E RMC no. 130 Mc

Audio-Visual:

"Graphs - Understanding
and Using Them" \$4.00
Coronet (1967) 11 min.
BAVI

Community:

Greenhouse
Gardens
Farm Areas

Continued and Additional Suggested Learning

I. continued

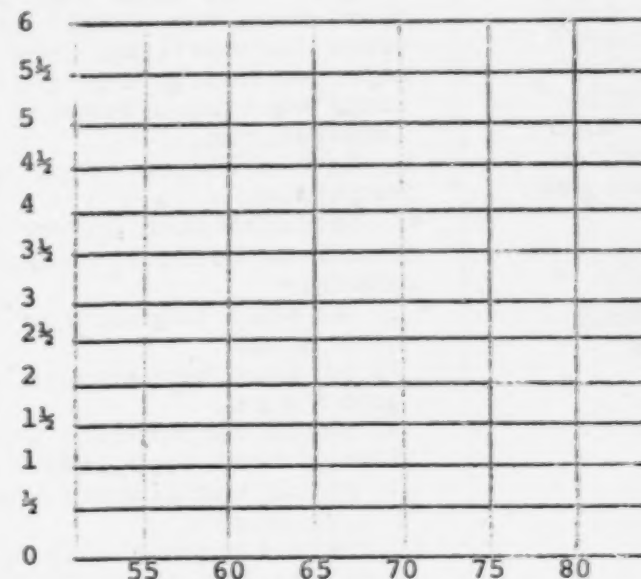
6. When would you expect pea plants to grow in winter, summer or spring?

7. What crops have you noted being affected by extreme temperatures?

8. How do the extreme temperatures for growth affect pea plant life?

Growth of pea seedlings in centi- meters	Temperatures (Degrees)					
	55	60	65	70	75	80
	1/2	3/4	1	2	3	5 1/2

Growth of pea seedlings
each day in centimeters



Science Materials

Continued and Additional Suggested Learning Experiences

ing Life

no. 130 Mc

nding
.00
min.

I. continued

6. When would you expect pea plants to grow best - in the winter, summer or spring?

7. What crops have you noted being affected by various temperatures?

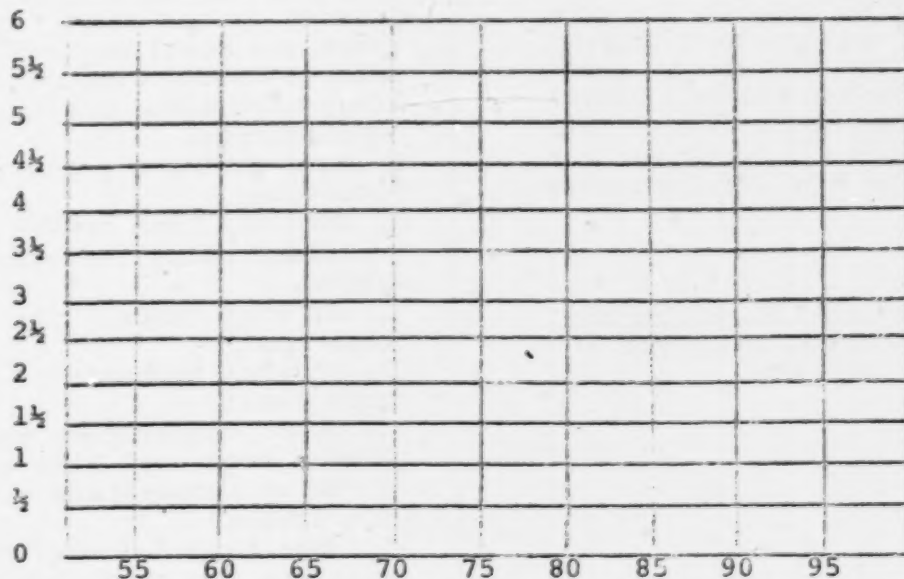
8. How do the extreme temperatures for growing affect your life?

Growth
of
pea
seedlings
in
centi-
meters

Temperatures (Degrees F.)

55	60	65	70	75	80	85	90	95
1/2	3/4	1	2	3	5 1/4	4	2 1/2	1

Growth of pea seedlings
each day in centimeters



C
O
N
C
E
P
T

1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.

Discipline Area Mathematics
Subject Metric Measuring
Problem Orientation Sun's Energy

BEHAVIORAL OBJECTIVES

Cognitive: The student will collect data and graph it to make predictions that extend beyond the observations made and graphed.

Affective: The student will defend putting a plant in the sun over putting plant in area devoid of sunlight.

Skills to be Learned

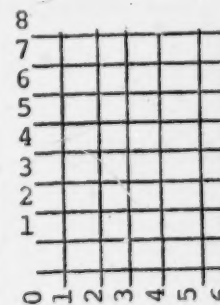
1. Making a line graph
2. Reading a meter stick
3. Learning terms lateral, terminal
4. Using metric system.

SUGGESTED LEARNING EXPERIENCES

- I. Student-Centered in class activity
 - A. Graphing growth of vines.
 1. Plant two vines, one in sunlight, the other in a place devoid of sunlight. Remove lateral growth so terminal growth can be easily measured.
 2. Attach each vine to meterstick for measuring purposes.
 3. Graph growth on line graph in centimeters, recording date of observations.
 - B. Vary conditions to see what effect variations have on pupils ability to predict growth. (Ex: Quit removing lateral growth)
 - C. Make predictions on future growth.
 - D. Find areas of various growth conditions to observe effect of sun on plants.

II. Outside Community

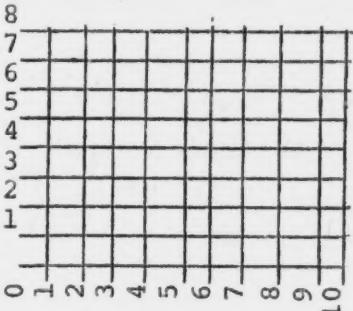
Growth of V



Days on which made

from the sun, the basic
energy, is converted
photosynthesis into a
ng things can use for
s.

Discipline Area Mathematics
Subject Metric Measuring preferred
Problem Orientation Sun's Energy Grade 5

ACTIVITIES	SUGGESTED LEARNING EXPERIENCES	
student a and predic- d beyond made student ing a over area ht. rned graph er stick s la- system.	I. Student-Centered in class activity A. Graphing growth of vines. 1. Plant two vines, one in sunlight, the other in a place devoid of sunlight. Remove lateral growth so terminal growth can be easily measured. 2. Attach each vine to meterstick for measuring purposes. 3. Graph growth on line graph in centimeters, recording date of observations. B. Vary conditions to see what effect variations have on pupils ability to predict growth. (Ex: Quit removing lateral growth) C. Make predictions on future growth. D. Find areas of various growth conditions to observe effect of sun on plants.	II. Outside Resource and Community Activities Growth of Vine in Centimeters  Days on which observations are made

Resource and Reference Materials	Continued and Additional Sugge
<u>Publications:</u> Darling, Lois and Louis <u>Place in the Sun: Ecology</u> <u>and the Living World</u>, Morrow 1968 <u>Audio-Visual:</u> 5553 <u>Photosynthesis</u> A 63 22 minutes, (\$8.75) BAVI 6743 <u>Green Plants and Sun-</u> <u>light</u>, \$4.00 BAVI (11 minutes) <u>Community:</u> Farm with particular vine crops. County Agent Greenhouse Gardens	

nd Reference Materials

Continued and Additional Suggested Learning Experiences

ns:

ois and Louis
ne Sun: Ecology
ving World, Morrow

al:

ynthesis A 63
, (\$8.75) BAVI
Plants and Sun-
OC BAVI (11 minutes)

particular vine

nt

C 2. All living organisms interact
O
N among themselves and their environment,
C
E forming an intricate unit called an
P
T ecosystem.

Discipline Area Mathematics
Subject Measuring - Com
Recognizing sha
Problem Orientation Ecosystem

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The student will identify and describe a square foot of school lawn and study natural life there in. <u>Affective:</u> The student will appreciate his surroundings and the forms of plant life. <u>Skills to be Learned</u> Measuring Recording Charting Gathering Data Drawing or sketching	I. Student-Centered in class activity A. A field trip is planned to the grass covered vacant lot areas or in a nearby field after a discussion is held in the schoolroom. 1. Aim of field trip. 2. How to find what a square foot is and the practical way to keep within that area. 3. What records will be kept? 4. Will specimens be preserved? How? 5. How will plants and insects be identified? What leaf patterns are there? 6. Which children will form respective groups? II. Outside Community A. Take children to grass covered area B. Measure square foot of ground - use string for boundary. C. Have children identify plants of 1. grass and record names 4. Find insects and record life D. What is the kind of plant in square foot of plot of the plan size, shape, etc. (terns.) E. Sketch or draw F. Investigate which the 1. on the surface affect the G. Compare plants with sunny differences in ties of life of species (continued)

arg organisms interact

Discipline Area Mathematics

elves and their environment,

Subject Measuring - Comparing Numbers

intricate unit called an

Problem Orientation Ecosystem Grade 5

OBJECTIVES

SUGGESTED LEARNING EXPERIENCES

student
and de-
fe foot of
d study
here in.

- I. Student-Centered in class activity
 - A. A field trip is planned to the grass covered vacant lot areas or in a nearby field after a discussion is held in the schoolroom.
 1. Aim of field trip.
 2. How to find what a square foot is and the practical way to keep within that area.
 3. What records will be kept?
 4. Will specimens be preserved? How?
 5. How will plants and insects be identified? What leaf patterns are there?
 6. Which children will form respective groups?

student
his
nd the
life.

earned

- II. Outside Resource and Community Activities
 - A. Take children to grass covered areas.
 - B. Measure off square foot of ground - using string for boundary.
 - C. Have children list the type of 1. grass 2. Clover (count and record on a chart) 3. Flowers 4. Fungi 5. Weeds 6. Insect life
 - D. What is the most common kind of plant found in square foot of plot? (Sketch a leaf of the plant showing actual size, shape, vein, edge patterns.)
 - E. Sketch organisms and identify.
 - F. Investigate three ways in which the living organisms on the surface of the ground affect the soil and plants.
 - G. Compare plots located in different places, shaded areas with sunny etc. to note differences in growth and varieties of life. Record numbers of species which have been (continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested Learning Ex
<u>Publications:</u> <u>Observing Properties</u> Minnemast Coordinated Mathematics - Sciences Series Unit 8 1967 at I-C-E RMC # 110 University of Minnesota National Science Teachers Association, <u>How to Read the</u> <u>Natural Landscape in Forests</u> <u>and Fields</u> by Mallard C. Davis. at I-C-E RMC (Teacher References) <u>Audio-Visual:</u> 7123 "Living Things Depend on Each Other" (color) 11 minutes EBF 1967 5677 "Life in a Cubic Foot of Soil" 11 minutes \$4.00 Coronet 1958 BAVI "Environmental Action - No time to Waste" Simulation game at I-C-E K 4 <u>Community:</u> Agricultural Agent	II. continued G. observed. H. Note season of year and refer to same area to compare changes. I. Find total number of square feet observed

Reference Materials	Continued and Additional Suggested Learning Experiences
ed ces Series -E RMC # 110 sota achers <u>Read the</u> <u>n Forests</u> ard C. Depend or) ac Foot of 00 on - No lation	II. continued G. observed. H. Note season of year and refer to same area again to compare changes. I. Find total number of square feet observed.

C. 3. Environmental factors are limiting Discipline Area Mathematics
 O on the numbers of organisms living Subject Rates - Graphing
 N within their influence, thus, each Problem Orientation Carrying Capacity
 C each environment has a carrying capacity.

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The learner will use rate pairs to estimate and graph the population change of fruit flies. <u>Affective:</u> The learner will test the factors that determine carrying capacity. <u>Skills to be Learned</u> Graphing Making and interpreting data tables Rates	I. Student-Centered in class activity A. Prepare a container (Use a plastic gallon jar, put 1/4 inch holes in the lid, fill the holes with cotton so air can enter. Peel a banana so 1/2 of the pulp is exposed and put into the container) 1. To collect the flies, leave the lid off until the flies begin to come. 2. When a sufficient amount have arrived, replace the cover, record the number of flies and the date. 3. After 10 days record the number of flies and the date. Put this information onto a data chart. 4. Set up a rate second gen./initial using this rate, calculate the estimated growth if it continues at this rate for two more weeks. Four more weeks. Put this estimated growth onto the graph. 5. Two weeks after your second generation count and record your population increase or decrease. Graph. How does it correlate with your estimate. Why is there a difference? (continued on reverse side)	II. Out of Class A. The speaker population sectors

Factors are limiting Discipline Area Mathematics
organisms living Subject Rates - Graphing
quence, thus, each Problem Orientation Carrying Capacity Grade 5
has a carrying capacity.

ES	SUGGESTED LEARNING EXPERIENCES	
er to ne er s ing ing	I. Student-Centered in class activity A. Prepare a container (Use a plastic gallon jar, put 1/4 inch holes in the lid, fill the holes with cotton so air can enter. Peel a banana so 1/2 of the pulp is exposed and put into the container) 1. To collect the flies, leave the lid off until the flies begin to come. 2. When a sufficient amount have arrived, replace the cover, record the number of flies and the date. 3. After 10 days record the number of flies and the date. Put this information onto a data chart. 4. Set up a rate second gen./initial using this rate, calculate the estimated growth if it continues at this rate for two more weeks. Four more weeks. Put this estimated growth onto the graph. 5. Two weeks after your second generation count and record your population increase or decrease. Graph. How does it correlate with your estimate. Why is there a difference? (continued on reverse side)	II. Outside Resource and Community Activities A. The county agent can speak on the increase of population of various insects.

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>Populations</u> SCIS Text - at I-C-E 100 Co Boughey, Arthur <u>Ecology of Population</u>, MacMillan Co. <u>Audio-Visual:</u> "Flies and Mosquitoes Their Life Cycle and Control" BAVI <u>Community:</u> County Agent Exterminator	I. continued 6. What about the food supply? Should you Does that change the Carrying capacity? B. If students are interested you may intro variations - size of environment (baby food cottage cheese box, etc.) food supply? The s use rates and estimate and graph growth.

Source Materials	Continued and Additional Suggested Learning Experiences
Text - at I-C-E Dur on, MacMillan	I. continued 6. What about the food supply? Should you add more? Does that change the Carrying capacity? B. If students are interested you may introduce other variations - size of environment (baby food jars) cottage cheese box, etc.) food supply? The student can use rates and estimate and graph growth.
as Their col" BAVI	

C
O
N
C
E
P
T

4. An adequate supply of pure water
is essential for life.

Discipline Area Mathematics
Subject Large numbers
Problem Orientation Water Conservation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCE	
<u>Cognitive:</u> Student will compute daily amounts of water used. <u>Affective:</u> From studying statistics and solving problems, the student sets a goal about one change in his home on conserving water. <u>Skills to be Learned</u> Large Numbers Problem Solving Graphs Measuring	I. Student-Centered in class activity A. In small groups work together on these problems: 1. If the average American uses 60 gallons of water a day, how many gallons is this per week? 2. If the community must produce 150 gallons per person per day, how much is this in your community per day? Per week? Month? Year? 3. Measure how much is needed for a shower. 4. The paper industry uses 90,000 gallons of water for 1 ton of paperboard. 5. How many gallons are needed for one pound of paper? 6. For 53,000,000 tons per year, how many gallons of water are used?	II. Outside Community A. As a home saving water ment from tion, p. 3 B. List the water in your way in which your family and after the class. C. Draw a water conservation school corner D. Collect paper articles statistics homes and

ate supply of pure water

Discipline Area Mathematics

for life.

Subject Large numbers - Measuring Graphs

Problem Orientation Water Conservation Grade 5

OBJECTIVES

SUGGESTED LEARNING EXPERIENCES

ert will
units of

em study-
and sol-
the stu-
l about
is home
ater.

arned

I. Student-Centered in class activity

- A. In small groups work together on these problems:
1. If the average American uses 60 gallons of water a day, how many gallons is this per week?
 2. If the community must produce 150 gallons per person per day, how much is this in your community per day? Per week? Month? Year?
 3. Measure how much is needed for a shower.
 4. The paper industry uses 90,000 gallons of water for 1 ton of paperboard.
 5. How many gallons are needed for one pound of paper?
 6. For 53,000,000 tons per year, how many gallons of water are used?

II. Outside Resource and Community Activities

- A. As a home experiment in saving water, try the experiment from publication Pollution, p. 34
- B. List the various uses of water in your home select one way in which the members of your family can conserve water and after two weeks report to the class.
- C. Draw a poster or cartoon on water conservation. (Post in school corridor.)
- D. Collect magazines or newspaper articles which include statistics on use of water in homes and industry.

Resource and Reference Materials

Continued and Additional Suggested Learning

Publications:

J.K. Couchman, D.F. Wentworth,
J.C. MacBean, A. Stecher,
Pollution, Holt Rinehart &
Winston, 1971, p. 67-68
I-C-E RMC

Audio-Visual:

"Water Famine" (54 min.)

Carousel Films Inc.

Broadway

New York, New York 10035

"Problems with Water is People"

(30 min.) color on request.

McGraw Hill Contemporary Films

330 W. 42nd Street

New York, New York 10018

Community:

Sources of water supply

1. City
2. Village
3. County

s	Continued and Additional Suggested Learning Experiences

C 5. An adequate supply of clean air is Discipline Area Math
 O essential because most organisms de- Subject Comput
 N pend on oxygen, through respiration, Problem Orientation Air
 C to release the energy in their food.

ESEA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The students will compute and record averages and estimates about problems on air pollution. <u>Affective:</u> The student will show his appreciation of an essential supply of clean air. <u>Skills to be Learned</u> Taking averages Computing averages Estimation	I. Student-Centered in class A. Use a stop watch and ask children to count the number of breaths taken in one minute. (This will be from 14-18). Compute the average number of breaths taken by the average class member in an hour, in a day. B. Compute Problem When the sulfur dioxide content of the air in New York City rises above .2 parts per million, 10 to 20 people die as a result. In the five years, 1965 to 1970, sulfur dioxide reached this level once every ten days. 1. What was the minimum number of people who died in New York City during the five years, 1965-1970, as a result of air pollution by sulfur dioxide. 2. What was the maximum number of people who died in New York City during the five years, 1965-1970 as a result of air pollution by sulfur dioxide. C. Obtain statistics from Air Pollution Control Section, Department (continued on reverse side)	II. A. ate ne 1. co a 2. an 3. ve lu qu in B. pre les por lut est and

of clean air is Discipline Area Mathematics
 organisms de- Subject Computation and Averaging
 h respiration, Problem Orientation Air Quality Grade 5
 in their food.

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class

A. Use a stop watch and ask children to count the number of breaths taken in one minute. (This will be from 14-18). Compute the average number of breaths taken by the average class member in an hour, in a day.

B. Compute Problem

When the sulfur dioxide content of the air in New York City rises above .2 parts per million, 10 to 20 people die as a result. In the five years, 1965 to 1970, sulfur dioxide reached this level once every ten days.

1. What was the minimum number of people who died in New York City during the five years, 1965-1970, as a result of air pollution by sulfur dioxide.
2. What was the maximum number of people who died in New York City during the five years, 1965-1970 as a result of air pollution by sulfur dioxide.

C. Obtain statistics from Air Pollution Control Section, Department (continued on reverse side)

II. Outside Resource and Community Activities

A. Take the class to a moderately busy intersection in the neighborhood.

1. Have one group of children count all cars that pass in a 10 minute period.
2. Another group counts trucks, and buses.
3. A third group counts any vehicle emitting visible pollution. (This will be done quietly using tallies on paper instead of voices).

B. On returning to classroom present an impromptu math lesson to determine the proportion of cars visibly polluting the air. Make a rough estimate of cars in community and again figure proportion.

Resource and Reference Materials

Publications:

Pollution: A Handbook for Teachers
by Dorothy Needham Scholastic Book
Service \$1.00

Air and Water Pollution Gerald
Leinwand and Gerald Popkin Wash-
ington Square Press
630 5th Avenue, N.Y., N. Y. 10020
Air Pollution, Addison Wesley I-C-E
RMC

The Sources of Air Pollution and
Their Control Public Health Service
Publications, No. 1548 U.S. Depart-
ment of Health and Welfare, Wash-
ington, D.C.

Air Pollution: Their Facts

National Tuberculosis and
Respiratory Disease Association
Air Pollution and You John
Quigley No. 676 University
extension offices in Wisconsin
1971 EQ Index National Wild-
life Federation at I-C-E RMC
Environmental Analysis by
Joseph Moran, Michael Morgan,
James Wiersma, UWGB Little & Brown
Testing for Air Pollution, U.S.
Department of Agriculture Science
Study Aid No. 5 price 10¢
Superintendent of Documents, U.S.
Government Printing Office,
Washington, D.C. 20402

Continued and Additional Suggested Lea

I. continued

C. ment of Natural Resources, Box 4
53701, concerning amounts of car
other dangerous gases that are b
the air by each automobile every
the projected number of automobi
driven by Americans in 1980 how
monoxide will be put into the ai
to 1970.

Audio-Visual:

0033 Air (10 Min) \$2.00 BAVI
Atmospheric Pollution Filmstrip
Ward's Scientific
0678 Air Pollution color (11 Min)
Men at Bay I-C-E RMC

Community:

National Tuberculosis and Respira
Association.

Continued and Additional Suggested Learning Experiences

I. continued

- C. ment of Natural Resources, Box 450, Madison, Wis. 53701, concerning amounts of carbon monoxide and other dangerous gases that are being put into the air by each automobile every day. Based upon the projected number of automobiles that will be driven by Americans in 1980 how much more Carbon monoxide will be put into the air in comparison to 1970.

Audio-Visual:

0033 Air (10 Min) \$2.00 BAVI
Atmospheric Pollution Filmstrip at I-C-E RMC
Ward's Scientific
0678 Air Pollution color (11 Min.) \$4.00 BAVI
Men at Bay I-C-E RMC

Community:

National Tuberculosis and Respiratory Disease Association.

C 6. Natural resources are not equally Discipline Area Mathematics
O distributed over the earth or over Subject Measurement & Comparison
N time and greatly affect the geo- Problem Orientation Unequal Res
C graphic conditions and quality of life. tribution

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The child will measure, compare and record the depth of topsoil and subsoil found in two locations in a valley, flat plain or hillside. <u>Affective:</u> The child will appreciate that the productivity of a given region may be related to the depth of the soil of that region. <u>Skills to be Learned</u> Observation Research Comparing Measuring Concluding	I. Student-Centered in class activity II. Outside Resources Community Activities A. With a soil conservationist, the child will bore soil samples on a hillside and from a valley below and measure topsoil in inches. Samples may be taken at a number so that a depth for each area. B. Measure length of various species of plants. How thin topsoil are. C. After it is collected, determine type of growth possible and how these affect and food resources. D. Compare types of productivity using soil. E. Go to an experimental area and measure various kinds of crops or lack of fertility. F. Invite a soil scientist to represent types in country and discuss with class how systems are dependent on soil.

resources are not equally Discipline Area Mathematics
over the earth or over Subject Measurement & Comparing Numbers
tly affect the geo- Problem Orientation Unequal Resource Dis- Grade 5
tributions and quality of life. tribution

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
child compare depth sub- to lo- ley, all-	I. Student-Centered in class activity	II. Outside Resource and Community Activities
child that of a be depth that rned		A. With a soil auger borrowed from the Soil Conservation Service, the class will bore soil samples from a local hillside and from a flat plain or valley below and measure the depth of the topsoil in inches. <u>Record</u> the depths, Samples may be taken in sufficient number so that a representative soil depth for each area will be determined. B. Measure length of grass or some species of plant growing on thick and thin topsoil areas. C. After it is completed the child will determine type and yield of plant growth possible for a geographic region and how these affect growth of plant and food resources available to man. D. Compare types of soil with their productivity using maps. E. Go to an experimental field in the area and measure the size of the various kinds of corn; of the fertilizers or lack of fertilizers. F. Invite a soil conservation service representative to compare soil depths and types in county and state, and discuss with class how crops and cropping systems are dependent on depth and type.

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> Ecology: The Farm, Banziger at I-C-E RMC 130 Mc 10 <u>Audio-Visual:</u> <u>Conserving Our Soil,</u> Today 11 min. 5079(film) \$2.25 Coronet 1960 BAVI 4733 <u>Treasures of the Earth</u> \$3.50 0819 <u>Yours is the Land</u> 20 min. \$6.75 BAVI <u>Community:</u> Soil Conservation Service Representative County Agent Local Farmer Horticulturist	

ing Exp	Materials	Continued and Additional Suggested Learning Experiences
	ziger) I <u>arth</u>	

C 7. Factors such as facilitating trans- Discipline Area Mathematics
 O portation, economic conditions, popu- Subject Ordered P
 N lation growth, and increased leisure Problem Orientation Popu
 C time have a great influence on changes
 P in land use and centers of population density.
 T

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The child will construct tables showing graphically how available facilities, space and resources will be necessarily shared with others if population growth continues at the present rate. <u>Affective:</u> The child will suggest how the increased population growth will affect land use and centers of population density.	I. Student-Centered in class activity A. With the principal's help, the child will determine from school records, the present ratio of students to each classroom, teacher, basketball, desk, or area of school space. 1. Construct graphic display showing this ratio. (ratios) B. Using projected population growth information set up ratios of students to classroom teachers, basketball etc. for ten years from now. If present number of teachers, rooms etc do not change. C. Based on the above graphic displays (pictographs might be preferable) a discussion could be developed comparing not only students to rooms or basketballs but people in the nation to land use areas or facilities and resources under increased population numbers.	II. Out of Classroom A. Involve child in giving public time. needs B. Use population data in fact graphically C. Dis
<u>Skills to be Learned</u> Collecting data Organizing Constructing Pictographs Making judgements		

such as facilitating trans- Discipline Area Mathematics
 economic conditions, popu- Subject Ordered Pairs - - Rate Pairs
 th, and increased leisure Problem Orientation Population Grade 5
 great influence on changes
 and centers of population density.

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
child tables locally how abilities, resources will shared popula- continues at ate.	I. Student-Centered in class activity A. With the principal's help, the child will determine from school records, the present ratio of students to each classroom, teacher, basketball, desk, or area of school space. 1. Construct graphic display showing this ratio. (ratios) B. Using projected population growth information set up ratios of students to classroom teachers, basketball etc. for ten years from now. If present number of teachers, rooms etc do not change. C. Based on the above graphic displays (pictographs might be preferable) a discussion could be developed comparing not only students to rooms or basketballs but people in the nation to land use areas or facilities and resources under increased population numbers.	II. Outside Resource and Community Activities A. Invite mayor or local official in to speak to class and give information on park and public facility use at present time. Ask him to predict future needs. B. Using predicted growth in population from above and ordered pairs skills, show increase in facilities and space (in graphic way) needed to maintain resources available per person. C. Discuss
learned ta pictographs arts		

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u> <u>The Population Bomb</u>, Ehrlich, Paul R. New York Ballantine Books, 1968 <u>Our Precarious Habitat</u>, Benarde, Melvin New York W.W. Norton & Co. Inc. 1970 <u>Audio-Visual:</u> "Population Trends - Ecological Crisis" at I-C-E RMC K 14 <u>Community:</u> Mayor Park Director	

Reference Materials	Continued and Additional Suggested Learning Experiences
<u>or Bomb, Ehrlich, Paul</u> <u>Ballantine Books, 1968</u> <u>ous Habitat, Benarde,</u> <u>Ycrk W.W. Norton &</u> <u>70</u> <u>Trends - Ecological</u> <u>-C-E RMC K 14</u>	

C
O
N
C
E
P
T

8. Cultural, economic social, Discipline Area Mathematics
and political factors determine Subject Computation -
status of man's values and attitudes Problem Orientation Attitude toward
toward his environment. population

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> Student will compute numbers and record rat population. He will compute total pounds of food destroyed by rats. <u>Affective:</u> Student will suggest that the population of rats will cause destruction and disease. Student will take part in rat extermination program. <u>Skills to be Learned</u> Estimating Computing totals Measuring Comparing	I. Student-Centered in class activity A. Students and teacher will have discussion on rat problem in their area. B. Through library research, local newspapers, consulting home and farm owners and industry. Students will learn about the seriousness of rat destruction and how it affects the economy. C. Measure length of 9 inches. Double it to get idea of size of full grown rat (including tail). D. He raises a new family of six every 30 days. 1. How many rats are born to one set of parents in a year if there are 12 families a year? 2. A rat can devour 17 lbs. of garbage a year. How much would a family of six devour in 3 years? 3. A rat carries bubonic plague via the rat flea. 25 million people died from this illness in Europe in 1343. Compare this to the size of New York City's (continued on reverse side.)	II. Outside Community A. To note there of: 1. Visit 2. Feed 3. Storage used by and industry 4. Dumps

nic social, _____ Discipline Area Mathematics
 rs determine _____ Subject Computation - Estimating
 ues and attitudes _____ Problem Orientation Attitude toward rat Grade 5 -
 ment. _____ population

ES	SUGGESTED LEARNING EXPERIENCES	
l e- y-	I. Student-Centered in class activity A. Students and teacher will have discussion on rat problem in their area. B. Through library research, local newspapers, consulting home and farm owners and industry. Students will learn about the seriousness of rat destruction and how it affects the economy. C. Measure length of 9 inches. Double it to get idea of size of full grown rat (including tail). D. He raises a new family of six every 30 days. 1. How many rats are born to one set of parents in a year if there are 12 families a year? 2. A rat can devour 17 lbs. of garbage a year. How much would a family of six devour in 3 years? 3. A rat carries bubonic plague via the rat flea. 25 million people died from this illness in Europe in 1343. Compare this to the size of New York City's (continued on reverse side.)	II. Outside Resource and Community Activities A. To note damage and prevention there of: 1. Visit farms 2. Feed mills 3. Storage areas or warehouses used by stores, restaurants, and industry. 4. Dumps.

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> McCue, George, <u>Ecology- The City</u> Benziger, Inc. New York at I-C-E RMC # 130 Mc10 <u>Audio-Visual:</u> 1815 <u>Rat Problem</u> \$3.00 1954 23 minutes - (Castle U.S. Army) BAVI 3623 <u>Control Rats</u> 1956 BAVI <u>Community:</u> County Agent Feed Mills Warehouses Farm Restaurants	I. continued D. 3. population today. 4. From given facts estimate annual cos

Materials	<u>Continued and Additional Suggested Learning Experiences</u>
he City t 54 Army) AVI	I. continued D. 3. population today. 4. From given facts estimate annual cost of rat damage.

C 8. Cultural, economic, social, and Discipline Area Mathematics
 O
 N political factors determine status of Subject Ratio and Ratio Com
 C man's values and attitudes toward Problem Orientation Attitude toward
 P his environment. lution abatement
 T

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The student will write in ratio forms, the voting trend on pollution abatement laws. <u>Affective:</u> The student is alert to laws which indicate positive attitude toward pollution.	I. Student-Centered in class activity A. Write to Senator Proxmire or Nelson to find statistics of voting on environmental questions and pollution abatement laws. B. From these materials set up table to show the change of voting, trend comparing your earliest reports with the later ones. C. Set up ratios of pro and con for each bill. D. Write a short statement to clarify the trend and explain the change. E. You may repeat the process with the SST. F. Use the simulation Game Recycling and Resources from I-C-E RMC Sg6 Set I.	II. Outside Real Community A. Business owner who has to deal with pollution abatement in to speak to B. Write a letter to further support laws. C. Try to find local pollution fire burning usage.
<u>Skills to be Learned</u> 1. Collection of data 2. Setting up data tables 3. Ratios 4. Interpreting data		

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>Man's Control of the Environment</u> <u>Congressional Quarterly</u> # 100 at I-C-E RMC <u>Pollution</u> Holt, Rinehart - Winston at I-C-E RMC <u>Congressional Record</u> from the State Senator <u>Audio-Visual:</u> "Living Earth" BAVI "Recycling and Resources" Kit SG6 from I-C-E RMC Set I <u>Community:</u> Newspaper Reporter Mayor or Business man	

Materials

Continued and Additional Suggested Learning Experiences

Environment

ly # 100

hart - Winston

from the

ces"

C Set I

C 9. Man has the ability to manage,
O
N manipulate, and change his en-
C
E vironment.
P
T

Discipline Area Mathematics
Subject Measurement,
Problem Orientation Land Use

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The student will draw to scale on paper 1/2 acre of land, landscape it and compute the cost of materials used. <u>Affective:</u> The student will suggest ways to improve his outdoor environment.	I. Student-Centered in class activity A. Have a landscaper speak to the groups on trees, shrubs, and space involved in planning. Encourage questions. B. Give Students 1. Grid with 1" squares 2. Tree and shrub catalog 3. Have them form groups C. Using the equipment above tell students they have about 1/2 acre of land, 104 X 209. They have a small creek or natural spring on their land. They are to plan cost of landscaping the 1/2 acre plot. D. Put the plan onto the grid in scale-model. E. When complete, if possible invite the landscaper to look at the maps, evaluating the appropriateness and placement of trees. F. Discuss the plans with the class, taking into account the use of the area, beauty of the area. G. Discuss actual parks and their aesthetic appeal. H. Use the Simulation Game - <u>Man and His Environment</u> from I-C-E RMC. II. Outside Community A. Visit B. Visit
<u>Skills to be learned</u> Square Area Addition of money Scale model drawing	

ability to manage, Discipline Area Mathematics
 change his en- Subject Measurement, Scale Models
 Problem Orientation Land Use Grade 5

ES	SUGGESTED LEARNING EXPERIENCES	
nt n nd, - er- nt	I. Student-Centered in class activity A. Have a landscaper speak to the groups on trees, shrubs, and space involved in planning. Encourage questions. B. Give Students 1. Grid with 1" squares 2. Tree and shrub catalog 3. Have them form groups C. Using the equipment above tell students they have about 1/2 acre of land , 104 X 209. They have a small creek or natural spring on their land. They are to plan cost of landscaping the 1/2 acre plot. D. Put the plan onto the grid in scale-model. E. When complete, if possible invite the landscaper to look at the maps, evaluating the appropriateness and placement of trees. F. Discuss the plans with the class, taking into account the use of the area, beauty of the area. G. Discuss actual parks and their aesthetic appeal. H. Use the Simulation Game - <u>Man and His Environment</u> from I-C-E RMC.	II. Outside Resource and Community Activities A. Visit the tree nursery. B. Visit a wayside or park.

Resource and Reference Materials

Continued and Additional Suggested Learning Experiences

Publications:

Dudley, Ruth H. Our American
Trees New York Crowell 1956

Bulla, Clyde R. A Tree is a
Plant Crowell, 1962

Buelcher, Jean M. & R.H.
Naoilles, A Tree is Born
New York Sterling, 1960

Udry, Janice M., A Tree is
Nice Harper and Row, 1956

Audio-Visual:

3873 "Tree Portrait" BAVI
"Man and His Environment"
Simulation Games from I-C-E
RMC

Community:

Landscaper
County Agent
Tree and shrub catalog
Stark Brothers
Louisiana
Missouri 63353

s	Continued and Additional Suggested Learning Experiences
---	---

C
O
N
C
E
P
T

10. Short-term economic gains may
produce long-term environmental
losses.

Discipline Area Mathematics
Subject Decimals - Pr
Problem Orientation Short-Long

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> Child will solve problems that deal with economic factors involving pollution. Child observes building landmarks etc. noting observations of environmental deterioration. <u>Affective:</u> The student will develop an appreciation for the above concept from working with problems dealing with the monetary aspect of environmental losses. <u>Skills to be Learned</u> Problem solving Reasoning, Observing Computing, Analyzing	I. Student-Centered in class activity A. We've used our waterways as dumping grounds for more than two centuries. The villains of the pollution of our waterways are Industry 65%, municipalities 20%, and Agriculture 15%. 1. If only 32 states have fully approved water quality standards how many do not? What is the percentage ratio of those that do to those that don't? 2. It will take a 5 year investment of \$42 billion to clean up water. Over half is industry's responsibility. If industries share is 3.2, 2.0, 4.0, 6.6, 1.0, and 7.7 billion dollars for various abatement needs, what is the total of Industry's financial responsibility? 3. What is the municipal financial responsibility? 4. At present North Americans are removing fresh water from underground sources twice as fast as it can be replaced. It is estimated that Americans will need 700 billion gallons of (continued on reverse side)	II. Outside Community A. Take nearest the effort in the area damaging and work marks and or must of these reality. B. Go on area not site that ing on side of of an ad The stor on the that aff to break

economic gains may Discipline Area Mathematics

term environmental Subject Decimals - Problem Solving

Problem Orientation Short-Long term factors Grade 5

ACTIVITIES	SUGGESTED LEARNING EXPERIENCES	
will at deal tors on. ilding ting nviron- ion. udent appre- bove ing ling as- ntal ned ing ing	I. Student-Centered in class activity A. We've used our waterways as dumping grounds for more than two centuries. The villains of the pollution of our waterways are Industry 65%, municipalities 20%, and Agriculture 15%. 1. If only 32 states have fully approved water quality standards how many do not? What is the percentage ratio of those that do to those that don't? 2. It will take a 5 year investment of \$42 billion to clean up water. Over half is industry's responsibility. If industries share is 3.2,2.0,4.0,6.6,1.0, and 7.7 billion dollars for various abatement needs, what is the total of Industry's financial responsibility? 3. What is the municipal financial responsibility? 4. At present North Americans are removing fresh water from underground sources twice as fast as it can be replaced. It is estimated that Americans will need 700 billion gallons of (continued on reverse side)	II. Outside Resource and Community Activities A. Take a field trip to the nearest "large city". Observe the effects of various acids in the atmosphere that are damaging buildings, landmarks, and works of art. Can old landmarks and buildings be restored or must they be replaced? Some of these buildings are, in reality, irreplaceable. B. Go on the school grounds or area not far from an industrial site that has plant life growing on it. Observe the upper side of the leaves for evidence of an accumulation of pollutants. The stomata are tiny openings on the underside of the leaves that afford the plant the ability to breathe.

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>The Only Earth We Have</u> Laurence Pringle, MacMillan Co. 866 Third Avenue, New York City 10022 \$4.50 hardcover, \$1.60 paperback <u>Schneider, Gerald, 1968 Conser-</u> <u>vation Teaching in the City</u> New York State Conservation Dept. (Resource Center) <u>Audio-Visual:</u> no. 250 <u>Men at Bay</u> I-C-E RMC BAVI 0678 - "Air Pollution" 11 minutes \$4.00 BAVI Journal 1968 <u>Community:</u> City Planner Historical Society	I. continued 4. underground water in 1980 (per year). billion gallons will be available, what available water to that which will be ne

Continued and Additional Suggested Learning Experiences

3. continued

4. underground water in 1980(per year). If only 650 billion gallons will be available, what is the ratio of available water to that which will be needed?

ESEA Title III - 59-70-0135-2 Project II-C-E

C O N C E P T Individual acts, duplicated or compounded, produce significant environmental alterations over time.	Discipline Area <u>Mathematics</u> Subject <u>Numeration (Multipli</u> Problem Orientation <u>Waste Disposal</u>
BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The student will compute the amount of waste-paper, bottles, or cans, etc., which could be found in a given area. <u>Affective:</u> Students will criticize actions of their own and their families and respond to the beauty of a litter-free landscape.	I. Student-Centered in class activity A. The class will select an area of roadside which they feel needs to be cleaned up and make preparations for an "environmental cleaning hike." 1. Bring bags in which to place various types of litter. 2. Volunteer to be on a group which picks up one type of litter (paper, cans, etc.)
<u>Skills to be learned:</u> Planning Observation Collecting Organizing Computing Criticizing	II. B. The class will determine what length of roadside they will clean up. 1. Determine how it will be measured. C. Compute the miles of roadside in their town-ship, county or state.

duplicated or _____ Discipline Area Mathematics
 be significant _____ Subject Numeration (Multiplication)
 erations over _____ Problem Orientation Waste Disposal Grade 5

IVES	SUGGESTED LEARNING EXPERIENCES	
dent will of waste- cans, etc., and in a given ts will criticize own and their ond to the beauty landscape.	I. Student-Centered in class activity A. The class will select an area of roadside which they feel needs to be cleaned up and make preparations for an "environmental cleaning hike." 1. Bring bags in which to place various types of litter. 2. Volunteer to be on a group which picks up one type of litter (paper, cans, etc.) B. The class will determine what length of roadside they will clean up. 1. Determine how it will be measured. C. Compute the miles of roadside in their township, county or state.	II. Outside Resource and Community Activities A. Tour a measured or known length of roadside collecting various classes of waste or litter (paper, cans, etc.) which can be weighed. 1. Record the amount of each class of waste 2. At this rate per mile, by multiplication, compute amount found in township, county or state. 3. Write to County Road Commissioner for mileage covered by County Cleanup Crews.
ed:		

Resource and Reference Materials

Publications:

National Wildlife Federation EQ
Index, I-C-E IMC

Bronson, William, How To Kill A
Golden State

Audio-Visual:

Film (color), Land Betrayed
(Riggins) 10 minutes, \$3.75
BAVI

Community:

Town Chairman
Road Commissioner

Continued and Additional Suggested Learning

I. (continued)

- D. Based on the amount of litter picked
activities, compute by multiplication
litter in townships, county or state

II. (continued)

4. Children living in village or city co
cost of cleaning in parks, streets, &
5. As a class project, organize and carry
community "clean up and spruce up" ca

ce Materials	Continued and Additional Suggested Learning Experiences
deration EQ	I. (continued) D. Based on the amount of litter picked up in outside activities, compute by multiplication the tons of litter in townships, county or state.
w To Kill A	
	II. (continued) 4. Children living in village or city could find cost of cleaning in parks, streets, etc.
	5. As a class project, organize and carry out a community "clean up and spruce up" campaign.
strayed \$3.75	

C 12. Private ownership must be re- Discipline Area Mathematics
 O garded as a stewardship and should Subject Computation
 N not encroach upon or violate the Problem Orientation Conservation
 C
 E
 P
 T individual right of others.

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The learner will compute amounts and costs of board feet used and wasted. <u>Affective:</u> The student will appreciate the monetary value of the tree for building purposes at the present and in the future.	I. Student-Centered in class activity A. Given the fact that an average family dwelling unit requires about 13,000 board feet of lumber. 1. Find the board foot requirement if 10 new homes are built. 2. Find board feet destroyed if 20 homes are demolished to clear a path for a highway. B. Find the cost of the board feet destroyed in number 2 above. C. List the effects of waste of board feet of lumber on lumber availability for future generations.	II. Outside Resources Community Activities A. Invite in a competition team to do ties of tearing ing homes in the posed building p B. Visit a lumber different kinds lumber. C. Visit a sawmill waste caused in boards. D. Talk to local learn how he con
<u>Skills to be Learned</u> Multiplying Observing Listing		

ownership must be re-
 stewardship and should
 upon or violate the
 right of others.

Discipline Area Mathematics
 Subject Computation
 Problem Orientation Conservation Grade 5

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
learner units rd sted. student the mon- ne tree poses nd	I. Student-Centered in class activity A. Given the fact that an average family dwelling unit requires about 13,000 board feet of lumber. 1. Find the board foot requirement if 10 new homes are built. 2. Find board feet destroyed if 20 homes are demolished to clear a path for a highway. B. Find the cost of the board feet destroyed in number 2 above. C. List the effects of waste of board feet of lumber on lumber availability for future generations.	II. Outside Resource and Community Activities A. Invite in a member of a demolition team to discuss difficulties of tearing down and rebuilding homes in the path of proposed building projects. B. Visit a lumber yard to see different kinds and grades of lumber. C. Visit a sawmill and note the waste caused in manufacturing boards. D. Talk to local carpenter and learn how he conserves materials.
igned		

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u> <u>Trail Guide</u> Berlin Outdoor Education Center I-C-E RMC Vertical file <u>Audio-Visual:</u> 6448 Lumberman (Color) 15 min. \$5.50 BAVI , 1965 <u>Let's Build a House</u>, Churchill Films, 6671 Sunset Boulevard, Los Angeles	
<u>Community:</u> Sawmill Lumber Yard House Construction Road Building sites	

rials

Continued and Additional Suggested Learning Experiences

ill
d,

C O N C E P T	<u>12 Private ownership must be re-</u>	Discipline Area _____
	<u>garded as a stewardship and should</u>	Subject _____
	<u>not encroach upon or violate the</u>	Problem Orientation _____
	<u>individual right of others.</u>	

FSEA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING ACTIVITIES
<u>Cognitive:</u> The child will compute the amount of wastepaper, bottles, or cans, etc. which could be found in a given area. <u>Affective:</u> Students will criticize actions of their own and their families and respond to the beauty of a litter free landscape.	I. Student-Centered in class activity A. The class will select an area of roadside which they feel needs to be cleaned up and make preparations for an environmental cleaning hike. 1. Bring bags in which to place various types of litter. 2. Volunteer to be on a group which picks up one type of litter, (paper, cans etc) B. The class will determine what length of roadside they will clean up. 1. Determine how it will be measured. 2. Compute the miles of roadside in their township, county or state. C. Based on the amount of litter picked up in outside activity compute or multiply the tons of litter in township, county, or state. Write to County Road Commissioner for mileage covered by County crews Use town - County - road maps to get own mileage or State offices may have figures on state highway miles
<u>Skills to be Learned</u> Planning Observation Collecting Organizing Computing Criticizing	

membership must be re-
 stewardship and should
 upon or violate the
 right of others.

Discipline Area Mathematics
 Subject Numeration (Multiplication)
 Problem Orientation Waste Disposal Grade 5

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
child amount bottles, which in a ents actions their pond to litter	I. Student-Centered in class activity A. The class will select an area of roadside which they feel needs to be cleaned up and make preparations for an environmental cleaning hike. 1. Bring bags in which to place various types of litter. 2. Volunteer to be on a group which picks up one type of litter, (paper, cans etc) B. The class will determine what length of roadside they will clean up. 1. Determine how it will be measured. C. Compute the miles of roadside in their township, county or state. D. Based on the amount of litter picked up in outside activity compute or multiply the tons of litter in township, county, or state. Write to County Road Commissioner for mileage covered by County crews. Use town - County - road maps to get own mileage or State offices may have figures on state highway miles.	II. Outside Resource and Community Activities A. Tour a measured or known length of roadside collecting various classes of waste or litter, (paper, cans, etc.) which can be weighed. 1. Record the amount of each class of waste. 2. At this rate per mile by multiplication, compute amount found in township, county or state. 3. Children living in village or city could find cost of cleanup in parks, streets, etc. 4. As a class project, organize and carry out a community "clean up and spruce up" campaign.
rned		

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>National Wildlife Federation</u> <u>EQ Index</u> 4 VF at I-C-E RMC <u>God's Own Junkyard</u>, Borgstrom George <u>How to Kill a Golden State</u> Bronseon, Wm. <u>Audio-Visual:</u> 6878 <u>Land Betrayed</u> (color) \$3.75 10 minutes (Riggins) 1967 BAVI <u>Community:</u> Town Chairman Road Commissioner	

ials	Continued and Additional Suggested Learning Experiences
m	

PROJECT I-C-E Episode Evaluation Form (Reproduce on

Please fill in:

Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode use form. Feel free to adapt it and add your critiques and comments - negative hand column, please rate (poor, good) make specific comments or suggestions provided to help us make this a more useful

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

I-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

Behavioral Objectives

A. Cognitive:

E. Affective:

Skills Developed

Suggested Learning Experiences

A. In Class:

B. Outside & Community Activities:

Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, WI 54301

ED 079157

Project I - C - E

INSTRUCTION - CURRICULUM - E

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 6

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, Wisconsin 54301
(414) 432-4338
(after Dec. 1, 1972 - 468-7464)

Robert
Robert
George

SE 016 545

- E

INSTRUCTION - CURRICULUM - ENVIRONMENT

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

Y PROGRAM FOR ENVIRONMENTAL EDUCATION

A Mathematics GRADE 6

Title III E.S.E.A.

s in CESA 3-8-9

et

consin 54301

1972 - 468-7464)

Robert Warpinski, Director
Robert Kellner, Asst. Director
George Howlett, EE Specialist

PREFACE

"Oikos" for house is the Greek origin of the term "ecology" studies our house--whatever or wherever it may be. Like an expand or contract to fit many ranges--natural and man-made environments, our many "houses" if we omit rancor and cite complexities. Our "oikos" uses the insights of all subjects multidisciplinary program like ours necessarily results. All a long time, our program ranges K thru 12. The environment values. These values have their origin in the "oikos" of our minds. Let us become masters of our house by replacing the with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your situation to adapt or adopt. Limitless chances are here for your effort. Many episodes are self contained, some open-minded, still developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no and no curriculum will work unless viewed in the context.
4. React to this guide with scratch ideas and notes on the episodes.
5. After using an episode, fill out the attached evaluation duplicate, or request more of these forms. Send them soon. We sincerely want your reactions or suggestions--negative evaluations are the key in telling us "what works" and in the guides.

----- TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all school districts in CESA 3, 8, and 9. Check the Project ICE resources. Our address and phone number is on this guide's cover or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University of Wisconsin, Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or product.

Affective refers to student attitudes, values, and feelings.

PREFACE

Our house is the Greek origin of the term "ecology". Environmental education is a house--whatever or wherever it may be. Like an umbrella, our house can contract to fit many ranges--natural and man-made. We can add quality to our houses, our many "houses" if we omit rancor and cite long range gains, costs, and values. Our "oikos" uses the insights of all subjects. Thus, a rational, positive, disciplinary program like ours necessarily results. Also, since attitudes grow over time, our program ranges K thru 12. The environment mirrors our attitudes or these values have their origin in the "oikos" of our collective and individual. Let us become masters of our house by replacing the Greek adage of "Know thyself" with "Know thyself and thine house."

and designed by your fellow teachers, this guide is supplementary in nature--appropriately into existing, logical course content. Each page or episode offers suggestions. Knowing your students best, you decide what to use or adopt. Limitless chances are here for your experimentation and usage. Episodes are self contained, some open-minded, still others can be changed or added over a few days. Use these episodes, but please pre-plan. Why? Simply, no guide has all the answers, your curriculum will work unless viewed in the context of your students. Use this guide with scratch ideas and notes on the episode pages. When using an episode, fill out the attached evaluation form in the back. Use, delete, or request more of these forms. Send them singly or collectively to us. We genuinely want your reactions or suggestions--negative and positive. Your reactions are the key in telling us "what works" and in aiding our revisions of episodes.

----- D ABBREVIATIONS

This is Project ICE Resource Materials Center serving all public and non-public school districts in CESA 3, 8, and 9. Check the Project ICE Bibliography of available materials. Our address and phone number is on this guide's cover. Feel free to write for any materials or help.

Bureau of Audio Visual Instruction, 1327 University Avenue, P. O. Box 2093, Madison, Wisconsin 53701 (Phone: 608-262-1644).

Knowledge means a measurable mental skill, ability, or process based on factual data. Attitude refers to student attitudes, values, and feelings.

ACKNOWLEDGEMENTS: The following teachers and consultants participated in the Supplementary Environmental Education C

CESA #3

D. C. Aderhold, Bonduel
 John Anderson, Peshtigo
 Walter Anderson, Wausaukee
 Bonnie Beamer, Coleman
 Merlyn Blonde, Shawano
 R. A. Dirks, Gillett
 Dennis Dobrzanski, White Lake
 LeRoy Gerl, Oconto
 Karen Grunwald, St. James (L)
 William Harper, Lena
 Sister Claudette, St. Charles
 Ervin Kunesh, Marinette
 Kathleen LeBreck, Oconto
 P. E. Lewicki, Gillett
 Dorothy C'Brien, Wausaukee
 Terry Otto, St. John (L)
 Arthur Paulson, Oconto Falls
 Marie Prochaska, Lena
 Christine Proctor, Wausaukee
 Arthur Schelk, Suring
 Peter Skroch, Oconto Falls
 David Soltesz, Crivitz
 Bill Stillion, Shawano
 Cathy Warnack, White Lake

Consultants

CESA #3

Dr. Richard Presnell,
 Univ. of Wisc.-Greer Bay

CESA #8

Dr. James Marks,
 Lawrence University

CESA #9

Dr. Charles Peterson,
 St. Norbert College

CESA #8

Mary Anders, Winneconne
 Robert Becker, Fox Valley (L)
 Mary Chriss, Hortonville
 Cliff Christensen, Winneconne
 Kenneth Couillard, Hortonville
 Raymond Emerich, Hortonville
 Mike Ercegovac, Winneconne
 Dona Geeding, Menasha
 Donald Hale, Winneconne
 James Huss, Freedom
 Sister Lois Jonet, Holy Angels
 Kenneth Kappell, St. Aloysius
 Kenneth Keliher, Appleton
 Everett Klinzing, New London
 Fred Krueger, Oshkosh
 Jim Krueger, Winneconne
 Mae Rose LaPointe, St. John High
 Rosemarie Lauer, Hortonville
 Robert Lee, Neenah
 Harold Lindhorst, St. Martin (L)
 Dennis Lord, Little Wolf
 Robert Meyer, Neenah
 Arnold Neuzil, Shiocton
 James Nuthals, Lourdes
 Connie Peterson, St. Martin (L)
 Rosemary Rafath, Clintonville
 Mark Reddel, St. Martin (L)
 Gladys Roland, Little Wolf
 Kathryn Rowe, Appleton
 Mary Margaret Sauer, Menasha
 Edwin Schaefer, Kaukauna
 Lee Smoll, Little Chute
 Doris Stehr, Mt. Calvary (L)
 Ginger Stuvetraa, Oshkosh
 Richard Switzer, Little Chute
 Tim Van Susteren, Holy Name
 Lila Wertsch, St. Margaret Mary
 Warren Wolf, Kimberly
 Gery Farrell, Menasha

Following teachers and consultants participated in the development
of supplementary Environmental Education Guides:

CESA #8

ke Mary Anders, Winneconne
L) Robert Becker, Fox Valley (L)
es Mary Chriss, Hortonville
Kenneth Christensen, Winneconne
Kenneth Couillard, Hortonville
Raymond Emerich, Hortonville
Mike Ercegovac, Winneconne
Dona Geeding, Menasha
L) Donald Hale, Winneconne
James Huss, Freedom
es Sister Lois Jonet, Holy Angels
Kenneth Kappell, St. Aloysius
Kenneth Keliher, Appleton
Everett Klinzing, New London
Fred Krueger, Oshkosh
Jim Krueger, Winneconne
s Mae Rose LaPointe, St. John High
Rosemarie Lauer, Hortonville
e Robert Lee, Neenah
Harold Lindhorst, St. Martin (L)
Dennis Lord, Little Wolf
Robert Meyer, Neenah
Arnold Neuzil, Shiocton
James Nuthals, Lourdes
Connie Peterson, St. Martin (L)
Rosemary Rafath, Clintonville
Mark Reddel, St. Martin (L)
Gladys Roland, Little Wolf
Kathryn Rowe, Appleton
Mary Margaret Sauer, Menasha
Edwin Schaefer, Kaukauna
Lee Smoll, Little Chute
Doris Stehr, Mt. Calvary (L)
Ginger Stuvettraa, Oshkosh
Richard Switzer, Little Chute
Tim Van Susteren, Holy Name
Lila Wertsch, St. Margaret Mary
Warren Wolf, Kimberly
Gery Farrell, Menasha

CESA #9

Peter Biolo, West DePere
Lee Clasen, Lux.-Casco
Kathryn Colburn, Algoma
Merle Colburn, Algoma
Sara Curtis, Green Bay
Duane DeLorme, Green Bay
Roberta Dix, St. Joseph Acad.
Janet Elinger, Ashwaubenon
Phyllis Ellefson, Wash. Isle.
Keith Fawcett, West DePere
Jack Giachino, Seymour
Mike Gleffe, St. Matthews
Herbert Hardt, Gibraltar
Gary Heil, Denmark
Nannette Hoppe, How.-Suam.
Joseph Hucek, Pulaski
Catherine Huppert, DePere
DeAnna Johnson, Denmark
Kris Karpinen, West DePere
Mel Kasen, Gibraltar
Jack Koivisto, Green Bay
Sister Mary Alyce, Cathedral
Ellen Lotz, West DePere
Judilyn McGowan, Green Bay
Priscilla Mereness, Wrightstown
C. L. Paquet, Denmark
William Roberts, Sturgeon Bay
Roger Roznowski, Southern Door
Jan Serrahn, Sevastopol
Calvin Siegrist, How.-Suam.
Mary Smith, Green Bay
Carol Trimberger, Kewaunee
Mary Wadzinski, How.-Suam.

C Energy from the sun, the basic source of all
 O energy, is converted through plant photo-
 N synthesis into a form all living things
 E can use for life processes.
 P
 T

Discipline Area

Subject

Problem Orientation

ESEA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The student, through the use of observation and conclusion, will compute the fractional parts of his community that can sustain adequate plant growth. <u>Affective:</u> The student will recognize certain growth of vegetation in accordance to direct rays of the sun compared to diverted rays of the sun.	I. Student-Centered in class activity A. Teacher states: Compare the sun's energy in certain areas of the school yard (according to plant growth). 1. Then have the students divide the yard into certain sections. a. Where sun rays hit directly. b. Where sun rays are diverted, etc. 2. Then, through the use of observation, have student compute the fractional parts of each section of the yard that can sustain plant growth.	II. Out-of-class activity A. B.
<u>Skills to be Learned</u> Graphing Charting Concluding Observing Recording		

ic source of all

n plant photo-

iving things

Discipline Area Math

Subject Fractions

Problem Orientation Energy Grade 6

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Teacher states:
Compare the sun's energy in certain areas of the school yard (according to plant growth).

1. Then have the students divide the yard into certain sections.

a. Where sun rays hit directly.

b. Where sun rays are diverted, etc.

2. Then, through the use of observation, have student compute the fractional parts of each section of the yard that can sustain plant growth.

II. Outside Resource and Community Activities

A. On a larger basis take the students on a field trip on a nearby street and have them section it as they did in the school yard.

B. Bring in an ecologist, florist, or landscaper and have him explain the different vegetation found in these areas and why they are found there.

Resource and Reference Materials	Continued and Additional Suggest
<u>Publications:</u> Any local articles on city pollution 1. Newspaper 2. Magazine <u>Audio-Visual:</u> Sound Filmstrip: <u>The Deciduous Forest</u>, Warren Schloat Films, Inc., West Nyack, N.y. Film: #6743 <u>Green Plants and Sunlight</u>, color, 11 min., \$4, (Intermediate level), 1966 B.A.V.I. <u>Community:</u> Get local authorities (i.e., City Planner or Park Commissioner) to lead a field trip through the city.	

Continued and Additional Suggested Learning Experiences

y
ty.

C O N C E P T	All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.	Discipline Area <u>Mathematics</u> Subject <u>Working</u> Problem Orientation <u>Ecology</u>
---------------------------------	--	--

BEHAVIORAL OBJECTIVES

Cognitive: The student will explain data presented in graphs and construct graphs to summarize data.

Affective: The student will become conscious of the various types of plants that are supported by these soils.

Skills to be learned:

Observation
Measuring
Classification
Recording
Concluding

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Measuring, recording, graphing plant growth at specific intervals.

1. Using an area map, discuss the possible sites for collecting soil (to obtain variety)
2. Actual work of preparing containers planting seeds or plants -- daily tasks to be carried out as plants begin to grow.
3. Measure and record the growth of a plant over regular intervals of time (use metric measure if possible).
4. Graph the recorded results of the plant growth with either bar, line, or picto-graphs.
5. Suggest integration with science unit

eract among _____ Discipline Area Mathematics
 ironment, _____ Subject Working with Graphs, Charts, Tables
 t called an _____ Problem Orientation Ecosystem Grade 6

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Measuring, recording, graphing plant growth at specific intervals.

1. Using an area map, discuss the possible sites for collecting soil (to obtain variety)
2. Actual work of preparing containers planting seeds or plants -- daily tasks to be carried out as plants begin to grow.
3. Measure and record the growth of a plant over regular intervals of time (use metric measure if possible).
4. Graph the recorded results of the plant growth with either bar, line, or picto-graphs.
5. Suggest integration with science unit

II. Outside Resource and Community Activities

A. Library

1. Locate information about the major soil groups in your area.

B. Immediate area - Nature hike

1. Observe abundance and variety of vegetation in different soils.

C. Field trip to a farm

1. Interview the farmer
 - a. What kind of soil
 - b. What type of plants

D. Field trip to a Florist

1. Observe plants grown under controlled conditions
2. Why do certain plants grow in certain soils?

Resource and Reference Materials

Continued and Additional Suggest

Publications:

Brennan, Mathew J., J. G.
Publishing Co., People and
Their Environment: Teachers'
Curriculum Guide to Conser-
vation Education, 6 N. Michigan
Ave., Chicago, Ill. 60602

Audio-Visual:

#55035 Seed Sprouting, time
lapse film, 2 min., Walt Disney
Education Materials Co., 800
Sonora Ave., Glendale, Calif.
91201

Community:

Farm
Florist
DNR
Library
School Forest or Outdoor
Center

als	Continued and Additional Suggested Learning Experiences
sney 0 f. gan	

C	<u>Environmental factors are limiting on the</u>	Disciplin
O	<u>numbers of organisms living within their</u>	Subject
N	<u>influence, thus, each environment has a</u>	Problem
C	<u>carrying capacity.</u>	

ESLA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES	SUGGESTED LEA
<u>Cognitive:</u> The student will differentiate between the sets given in the classroom activity. <u>Affective:</u> The student will appreciate, through observation of life in an aquarium, that each environment has its own carrying capacity.	I. Student-Centered activity A. Guppy food set 1. Set up 10 g aquarium sys ped with ave filtration a tion systems 2. Daily supply maximum amou fish food fo guppies to s (Set I) 3. Put 10 male and 10 femal tank. (Set I 4. When second tion of fish watch for di of the balanc compared to capacity of to survive. 5. Use O₂ instea
<u>Skills to be learned:</u> Observation Comparison Recording Naming Classifying	

Factors are limiting on the _____ Discipline Area Mathematics
 organisms living within their _____ Subject Sets
 each environment has a _____ Problem Orientation Carrying Grade 6
 _____ Capacity

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Student will dif- fer the sets given activity.	I. Student-Centered in class activity A. Guppy food set study 1. Set up 10 gallon aquarium system equipped with average filtration and aeration systems. 2. Daily supply of maximum amount of fish food for twenty guppies to survive (Set I) 3. Put 10 male guppies and 10 females in tank. (Set II) 4. When second generation of fish appear, watch for disturbance of the balance of food compared to carrying capacity of the fish to survive. (Set III) 5. Use O ₂ instead of food.	II. Outside Resource and Community Activities A. Take a field trip to nearest natural body of water and note various life forms in the woods and lakes. B. Use local library or school library to look up deer, bird, etc. populations according to the carrying capacity of the land. C. Have a conservationist come in and talk on some of the above mentioned subjects and topics.
Student will through observation aquarium, that each has own carrying ned:		

Resource and Reference Materials	Continued and Additional Su
<u>Publications:</u> <u>Little, Charles E., Challenge of the Land, N.Y. :Oxford University 1949</u> <u>Stewardship - The Land - The Land Owner - The Metropolis, N. Y. Open Space Institute, Inc. 1968</u> <u>Audio - Visual:</u> <u>Interdependence of Living Things , I-C-E RMC , Filmstrip Set #13</u> <u>Community:</u> Library Lake DNR Office	

ence Materials

Continued and Additional Suggested Learning Experiences

, Challenge of
ford University

Land - The Land
olis, N. Y. Open
nc. 1968

Living Things ,
trip Set #13

Project I-C-E

ESEA Title III - 59-70-0135-2

C An adequate supply of pure
O
N water is essential to life.
C
E
P
T

Discipline Area Mathema

Subject Recordi

Problem Orientation

BEHAVIORAL OBJECTIVES

Cognitive: Observe and record the amount of water used and wasted within the school and community.

Affective: The student will offer suggestions of ways in which water can be conserved.

Skills to be learned:

Knowledge of liquid measures (standard and metric)
Conservation of smaller to larger units over time and rate
Problem solving

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Measurement of water waste as school water fountain continuously run.

1 How much water is wasted from a leaky faucet?

2 Number of students in class versus amounts of water used on an average (60 gallons) per person per day. Number of people in the community

B. Procedures:

1 Use containers expressing standard and metric units of measurement (cups, pints, quarts and gallons)

2 Compute amounts collected per hour in relation to number of hours in school day, week, year, etc.

Core _____ Discipline Area Mathematics
 Life. _____ Subject Recording-Problem Solving-Measurement
 _____ Problem Orientation Water Grade 6

VES	SUGGESTED LEARNING EXPERIENCES	
record and and will s conserved.	I. Student-Centered in class activity A. Measurement of water wasted as school water fountains continuously run. 1 How much water is wasted from a leaky faucet? 2 Number of students in class versus amounts of water used on an average (60 gallons) per person per day. Number of people in the community B. Procedures: 1 Use containers expressing standard and metric units of measurement (cups, pints, quarts and gallons). 2 Compute amounts collected per hour in relation to number of hours in school day, week, year, etc.	II. Outside Resource and Community Activities A. Waste treatment plant 1. How many gallons of water a day are used? 2. What is added to the water? 3. Controls concerning water usage. B. A Home 1. Tabulations (same as above) a. Kitchen b. Bathroom
measures to and		

Resource and Reference Materials

Continued and Additional Sug

Publications:

Leinwand, Gerald and Popkin, Gerald
Air and Water Pollution,
Washington Square Press
630 Fifth Ave., N.Y. City 10020

Audio-Visual:

Kit #5, Aggradation - Degradation,
(set of 10 filmstrips) Eye Gate
House, Inc. 1970, I-C-E RMC

Water Famine, 54 minutes, Carousal
Films, Inc., 1501 Broadway, New
York, N.Y. 10035

Problem with Water is People, 30
minutes, request color, McGraw - Hill
Contemporary Films, 330 W. 42nd Street,
New York, N.y. 10018

Community:

Community Water Department
Sewage Plant

ce Materials

Continued and Additional Suggested Learning Experiences

Popkin, Gerald
ion,
ess
City 10020

- Degradation,
s) Eye Gate
C-E RMC

utes, Carousal
oadway, New

s People, 30
or, McGraw - Hill
330 W. 42nd Street,

rtment

LSLA Title - 59-70-0135-2 Project I-C-E

C An adequate supply of clean air is Discipline Area Math
 O essential because most organisms depend Subject Geor
 N on oxygen, through respiration, to Problem Orientation
 C release the energy in their food.

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
<u>Cognitive:</u> The student will determine and record the amount of air needed for his survival. <u>Affective:</u> The student will be alerted to the need for and supply of clean air. <u>Skills to be learned:</u> Practice in metric systems Computation of area and volume of prisms	I. Student-Centered in class activity A. Measuring and recording volume of air - Determine surface area and volume of your classroom (prism) (length x width x height) - Determine the average amount of air per breath, per child, through the use of plastic bags and immersion (volume). This can be tested in one of the following ways: - Place water in a beaker (half full). Emerge the bag into the water and check the displacement (metric system)

(continued on reverse side)

supply of clean air is _____ Discipline Area Mathematics
 cause most organisms depend Subject Geometry
 rough respiration, to Problem Orientation Air Grade 6
 energy in their food. _____

GENERAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Student will record the amount of his survival.	I. Student-Centered in class activity A. Measuring and recording volume of air 1. Determine surface area and volume of your classroom (prism) (length x width x height) 2. Determine the average amount of air per breath, per child, through the use of plastic bags and immersion (volume). This can be tested in one of the following ways: a. Place water in a beaker (half full). Emerge the bag into the water and check the displacement (metric system)	II. Outside Resource and Community Activities A. Calculate the cubic feet (meters) of area in the students' home. B. Research the average amount of air used by the average adult. C. Investigate the effects of vigorous physical activity on breath per minute.
Student will need for and air. named: c systems area and volume		

(continued on reverse side)

Resource and Ieference Materials	Continued and Additional Suggested
<u>Publications:</u> Aylesworth, Thomas G. <u>This Vital Air</u> <u>This Vital Water: Man</u> <u>Environmental Crisis,</u> Ran McNally, 1968, \$4.95 <u>Audio-Visual:</u> <u>Air Pollution, Part A</u> Pergamon Publishing Co., Maxwell House, Fairview Park, Elmsford, N.Y., 10523 <u>With Each Breath</u> 29 minutes, color Health Educational Services Box 7283, Albany, N.Y., 12224 <u>Air Pollution; Take a Deep</u> <u>Deadly Breath</u>, 3 parts total 54 minutes, color, free. National Medical Audio-Visual Center Chamblee, Georgia 3005 <u>Community:</u> City Health Department	I. (continued) b. Fill a beaker and place a As the bag is immersed, th beaker and go into the pan in the pan (metric system) 3. Determine the average number o available in the room. 4. Calculate the number of breath the room. B. Enrichment: 1. Make allowances for the area o by tables and chairs and other 2. Make allowance for the amount used per breath. 3. Remember you are breathing "us

ence Materials

Continued and Additional Suggested Learning Experiences

1.95

10523

Services
12224

Deep
total 54

o-Visual Center
5

I. (continued)

b. Fill a beaker and place a pan next to the beaker.
As the bag is immersed, the water will leave the
beaker and go into the pan. Measure the water
in the pan (metric system).

- 3. Determine the average number of breaths per minute,
available in the room.
- 4. Calculate the number of breaths of air available in
the room.

B. Enrichment:

- 1. Make allowances for the area of the room occupied
by tables and chairs and other fixtures.
- 2. Make allowance for the amount of oxygen not actually
used per breath.
- 3. Remember you are breathing "used" air to begin with.

C Natural resources are not Discipline Area Mathematics
 O equally distributed over the earth Subject Problem Solving
 N or over time and greatly affect the Problem Orientation Natural
 C geographic conditions and quality of life. Resources

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The student will differentiate soil formations and their ability to sustain life in a given geographic area. <u>Affective:</u> The student will appreciate all life forms in contrast to the various geographic conditions of the earth.	I. Student-Centered in class Activity A. Differentiate between soil formation and its ability to sustain life. 1. Gather all the soil types you can get around the school grounds (black dirt, gravel, sand, red clay, silt, etc.) 2. Then plant various vegetation (beans or corn) in each soil sample and make certain hypotheses of what is going to happen to plant growth. 3. Then observe plant growth according to a certain time ratio and see how close original hypotheses were. 4. Chart, graph or otherwise record data for comparisons.	II. Outside Community A. Take a trip to a local farm or garden to see how soil is used in agriculture. B. Have a class discussion about the importance of soil in our lives.
<u>Skills to be Learned:</u> Research Concluding Hypothesizing Observation Time Ratio		

e not _____ Discipline Area Mathematics
 over the earth _____ Subject Problem Solving
 atly affect the _____ Problem Orientation Natural Grade 6
 s and quality of life. _____ Resources

	SUGGESTED LEARNING EXPERIENCES	
will ations stain nic will ms in geo- ne earth.	I. Student-Centered in class Activity A. Differentiate between soil formation and its ability to sustain life. 1. Gather all the soil types you can get around the school grounds (black dirt, gravel, sand, red clay, silt, etc.) 2. Then plant various vegetation (beans or corn) in each soil sample and make certain hypotheses of what is going to happen to plant growth. 3. Then observe plant growth according to a certain time ratio and see how close original hypotheses were. 4. Chart, graph or otherwise record data for comparisons.	II. Outside Resource and Community Activities A. Take a field trip around surrounding area and compare various vegetation to different soil formations. (See what grows along roadside or bank of river, etc.) B. Have a soil conservationist come in and give a talk on soil types and what vegetation and animal life will be found in these certain areas.

Resource and Reference Materials	Continued and Additi
<u>Publications:</u> <u>The Natural Resources of Wisconsin</u> (or any other state) <u>The National Resources Committee of State Agencies</u> (Madison, Wisconsin 1956) <u>Audio-Visual:</u> <u>Why plants Grow Where They Do</u> color, 11 minutes, Coronet <u>Our Natural Resources</u>, color 11 minutes, BAVI <u>Community:</u> Get a local Conservationist to talk with students	

Reference Materials	Continued and Additional Suggested Learning Experiences
Resources of any other state) Resources Committee cies Wisconsin 1956) ow Where They Do utes, Coronet Resources, color AVI onservationist students	

C 7. Factors such as facilitating trans- Discipline Area Mathematics
 O portation, economic conditions, popula- Subject Percent
 N tion growth, and increased leisure Problem Orientation Changes in Le
 E time have a great influence on changes in Time
 P land use and centers of population density.
 T

Project I-C-R
 ESEA Title III - 59-70-0135-2

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The student will compare (using the percent of change type of problem) use of time, land, population density today with use of same during student's grandparents' time. <u>Affective:</u> The student will see the importance and seek the opportunity of being able to use and influence others in use of time, land, resources.	I. Student-Centered in class activity A. Using data and information collected in outside resource activity at right, student will compare (by percent of change) such changes as: 1. Length of working day (hours) 2. Length of vacations (days or weeks) 3. Amount of money earned per day (dollars) 4. Size of community in areas (blocks) 5. Size of community by population (numbers) B. Use information given by DNR representative to find percent of change in amount of land use for public recreation.	II. Outside Community A. Field trip to area of interest B. Interview with DNR representative
<u>Skills to be learned:</u> Interviewing Collecting Information Comparing		

such as facilitating trans- Discipline Area Mathematics
 economic conditions, popula- Subject Percent
 and increased leisure Problem Orientation Changes in Leisure Grade 6
Time
 great influence on changes in
 centers of population density.

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
student will the percent of (problem) use of population density of same during dparents' time. student will see and seek the being able to nce others in and, resources.	I. Student-Centered in class activity A. Using data and information collected in outside resource activity at right, student will compare (by percent of change) such changes as: 1. Length of working day (hours) 2. Length of vacations (days or weeks) 3. Amount of money earned per day (dollars) 4. Size of community in areas (blocks) 5. Size of community by population (numbers) B. Use information given by DNR representative to find percent of change in amount of land use for public recreation.	II. Outside Resource and Community Activities A. Each student will interview his parent and grandparent or elderly neighbor to collect data and information to use in showing percent of change in regard to items to be used in class activity at left. Specific interview questions might be: 1. How many hours per day did you work? 2. How many days/weeks vacation did you get? 3. How much were you paid per day? B. Invite DNR, local tourist trade owner, local soil agent, forester, etc., to talk to class and give information as to amount of public land (continued on reverse)
learned: ormation		

Resource and Reference Materials	Continued and Additional Suggested Le
<u>Publications:</u> Benarde, Melvin A. <u>Our Precarious Habitat</u>, W. W. Norton and Co., Inc., N.Y., 1970 Ehrlich, Paul R., <u>The Population Bomb</u>, Ballantine Books, N.Y., 1968 <u>Audio-Visual:</u> <u>The Squeeze</u>, Mass Media Ministries, 2116 North Charles Street, Baltimore, Maryland 21218 #4278 <u>Cities are Different and Alike</u>, color, 11 minutes, \$4.75, BAVI #0984 <u>Cities -- How They Grow</u>, 2nd Edition, 11 minutes, \$2.00, BAVI <u>Community:</u> DNR Representative Tourist - Resort owner or business man Soil Agent (County) Forest Ranger Curator of city or county park	II. (continued) available for recreational use and 1,2,5,10 years ago.

Reference Materials	Continued and Additional Suggested Learning Experiences
Our t, W. W. Norton Y., 1970 The Population Books, N.Y., 1968 Media Ministries, s Street, nd 21218 Different and Alike, , \$4.75, BAVI ow They Grow, 2nd es, \$2.00, BAVI ve owner or bus- y) or county park	II. (continued) available for recreational use today and 1,2,5,10 years ago.

CONCEPT Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.

Discipline Area Mathematics

Subject Percent

Problem Orientation Influence for Change

ESRA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCE	
<u>Cognitive:</u> The student will use simple percentage to find and express change in land use and changes in centers of population density. <u>Affective:</u> The student will become aware of changes in land use and population density in his own area or community. He will recognize the need for proper planning and laws regulating change.	I. Student-Centered in class Activity A. Using local voter registration figures, student will show % of increase or decrease in voter population. B. Using school enrollment figures compute and show % of increase or decrease in school population from one year or period to another. C. Using USDA figures in land use change (acres or square miles) use percent in expressing land use change (i.e., "urban sprawl" - vs - corn fields.) D. Use data given in class by guest speakers to find percent of change.	II. Outside Community A. In Su to on ch th B. In or cl me in me po C. In ta in us in D. In to E. In to
<u>Skills to be Learned:</u> Observation Investigation Research Comparing Reporting Reflection Making judgements Establishing Conclusions		

Facilitating trans- Discipline Area Mathematics
 mic conditions, pop- Subject Percent
 and increased leisure Problem Orientation Influence for Change Grade 6
 t influence on changes in land
 of population density.

ACTIVITIES	SUGGESTED LEARNING EXPERIENCES	
student will use ge to find and in land use and ers of popula- student will changes in population own area or will recognize pper planning ing change.	I. Student-Centered in class Activity A. Using local voter registration figures, student will show % of increase or decrease in voter population. B. Using school enrollment figures compute and show % of increase or decrease in school population from one year or period to another. C. Using USDA figures in land use change (acres or square miles) use percent in expressing land use change (i.e., "urban sprawl" - vs - corn fields.) D. Use data given in class by guest speakers to find percent of change.	II. Outside Resource and Community Activities A. Invite Principle or Superintendent of schools to give a talk to class on school enrollment changes and problems that have resulted. B. Invite Chief of Police or Sheriff to talk to class on changes in methods or problems involving law enforcement resulting from population change. C. Invite County Agent to talk to class on change in local county land use and problems resulting from these changes. D. Invite Farmer to speak to class. E. Invite and Industrialist to speak to class.
arned: ES conclusions		

Resource and Reference Materials	Continued and Additional Learning Ex
<u>Publications:</u> <u>A Different Kind of Country</u> 2nd Ed., Wiley, 1968 Statistical Abstracts from school libraries U.S. Government Printing Office reprints <u>Audio-Visual:</u> <u>People, Our Most Valuable Resource,</u> McGraw - Hill Co. <u>The City and The Future,</u> Sterling Educational Films <u>All Kinds of People, 13 minutes,</u> \$5, color #3999 BAVI <u>Community:</u> Farmer Industrialist Police Department Principle or Superintendent of Schools	

ence Materials	Continued and Additional Learning Experiences
<u>of Country</u> 1968	
acts from	
rinting Office	
<u>Valuable Resource,</u>	
<u>uture,</u> <u>al Films</u> e, 13 minutes, VI	
rintendent	

C 8. Cultural, economic, social, and
O
N political factors determine status
C
E of man's values and attitudes
P
T toward his environment.

Discipline Area Mathematics

Subject Graphs

Problem Orientation Litter

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The student will estimate long-range effect of litter on current data, portraying it in graph form. <u>Affective:</u> The student will suggest ways of improving the litter problem in his community.	I. Student-Centered in class activity A. Litter in the Classroom 1. Dispense with janitorial services in the classroom for a period of time (at least 1 week). Note the day to day accumulation of scrap paper, pencil shavings, paper towels, etc. 2. List and graph different types of refuse accumulated from day to day. 3. Estimate yearly accumulation. B. Discussion: 1. Do students feel that the money spent to	II.
<u>Skills to be learned:</u> • Graphing • Estimation (over a long range period based on knowledge of present information).		

(continued on reverse side)

nomic, social, and Discipline Area Mathematics
 s determine status Subject Graphs
 and attitudes Problem Orientation Littering Grade 6
 onment.

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
student will nge effect rent data, graph form. tudent will improving em in his	I. Student-Centered in class activity A. Litter in the Classroom 1. Dispense with janitorial services in the classroom for a period of time (at least 1 week). Note the day to day accumulation of scrap paper, pencil shavings, paper towels, etc. 2. List and graph different types of refuse accumulated from day to day. 3. Estimate yearly accumulation. B. Discussion: 1. Do students feel that the money spent to (continued on reverse side)	II. Outside Resource and Community Activities A. Investigation of littering in the community. 1. Have children stand for about 30 minutes of a busy hour near a store, restaurant, or garage and tally the litter dropped or thrown by passers-by. List according to types of litter and make a graph depicting the results. 2. In class activity to follow exercise No. 1: Our community has a (\$50) fine for littering. How much money would have been collected "yesterday" in just our neighborhood if that law were (continued on reverse side)
urned: a long ed on know- infor-		

Resource and Reference Materials

Continued and Additional Sources

Publications:

I. (continued)

Pringle, Laurence, The Only Earth We Have, Mac Millan Company, 866 Third Avenue, New York City, N.Y. 10022, \$4.50

1. salary the custodians
2. What would happen if the crews or custodians refuse to clean up "behind them"

Man's Control of the Environment, Congressional Quarterly 1970 #100MA I-C-E RMC

Audio-Visual:

II. (continued)

House of Man - Our Changing Environment, 17 minute, color, Encyclopedia Britanica Educational Corp., 425 N. Michigan Ave., Chicago, Ill., 60611

2. enforced. Have students keep individual totals of littering. Have a final class total appreciation of the cost of taxpayers for cleaning up littering to businessmen, etc.

Our Vanishing Land, Mc Graw - Hill Contemporary Films, 330 W. 42nd Street, New York, N.y. 10018

Community:

Community or County Department which collects litter or refuse.

Reference Materials Continued and Additional Suggested Learning Experiences

I. (continued)

e, The Only Earth We
Company, 866 Third
City, N.Y. 10022,

1. salary the custodian is well spent?
2. What would happen if there were no highway crews or custodians, or sanitation workers to clean up "behind us"?

the Environment,
Quarterly 1970
C

II. (continued)

Our Changing
minute, color,
tanica Educational
Michigan Ave.,
0611

2. enforced. Have students figure their individual totals; help them compile a final class total. Lead children to an appreciation of the economic effects of littering. Have them consider the cost of taxpayers for streetcleaning, the cost to businessmen, etc.

nd, Mc Graw -
y Films, 330 W.
York, N.y. 10018

nty Department
itter or refuse.

C 9. Man has the ability to manage, _____ Discipline Area
 O _____
 N manipulate, and change his environment. Subject
 C _____
 E _____ Problem Orient
 P _____
 T _____

ESEA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES

Cognitive: The student will identify and list the effects of varying concentrations of salt on native vegetation.

Affective: The student will realize and appreciate the ability that man has to change and manipulate his environment and recognize the inherent danger of that practice.

Skills to be learned:

Observing
 Recording
 Measuring (dimension and liquid)

SUGGESTED

I. Student-Centered class activities

A. Salt effects on vegetation

1. The student will construct terrariums (boxes) and place them with various types of vegetation.
2. Maintain terrariums with equal amounts of water and light for about a week.
 - a. It will be necessary to measure the amount of water exposed to sun, moisture, and amount of vegetation in each.

(continued on reverse)

ability to manage, Discipline Area Mathematics
 change his environment. Subject Measurement
 Problem Orientation Management of Roads Grade 6
and adjacent lands

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Student will identify effects of varying salt on native Student will realize the ability that man manipulate his envi- ronment. The inherent practice.	I. Student-Centered in class activity A. Salt effects on vegetation. 1. The students will construct 4 ter- rariums (window boxes) and fill them with native vegetation. 2. Maintain the terrariums with equal amounts of water and sunlight for about ten days. a. It will be nec- essary to measure equal amounts of water, soil, exposure to the sun, and esti- mate the type and amount of vegetation in each box.	II. Outside Resource and Community Activities A. Take a field trip and observe the amount and type of vegetation along a road that is salted throughout the winter and one that received no salt treat- ment. B. Find out how much salt the county uses on roads during the month of February. Calculate the cost. C. Research the effect of excess amounts of salt on small game.
ed: on and		

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>Anderson, Edgar, Plants, Man and Life, University of California Berkeley, 1967</u> <u>Dasmann, Raymond F., A Different Kind of Country, Mac Millan, 1968</u> <u>Audio-Visual:</u> <u>Ecology and Man Series - Set #3</u> <u>FS ST11 I-C-E RMC</u> <u>Community:</u> County Department of Highways	I. (continued) 3. Introduce a strong solution box #1, a weaker solution salt into boxes #3 and #4. 4. Maintain a salting procedure ten days and carefully observe progress of all four boxes. 5. Salt solution must be carefully insure constant dosage. 6. Conduct an experiment showing effects of salt on ice. Suitable for science or social studies class.

Materials	Continued and Additional Suggested Learning Experiences
s, Man and California Different Allan, 1968 - Set #3 highways	I. (continued) 3. Introduce a strong solution of salt water into box #1, a weaker solution into box #2, and no salt into boxes #3 and #4. 4. Maintain a salting procedure for an additional ten days and carefully observe and record the progress of all four boxes. 5. Salt solution must be carefully measured to insure constant dosage. 6. Conduct an experiment showing the physiological effects of salt on ice. Suggest integration with science or social studies classes.

C O N C E P T	10. Short-term economic gains may	Discipline Area	Mathematics
	produce long-term environment-	Subject	Decimal Fra
	al losses.	Problem Orientation	Short-1 fac

Project I-C-E

ESEA Title III - 59-70-0135-2

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXP
<u>Cognitive:</u> The student will determine by decimal fractions the dollar value of environmental clean-up. <u>Affective:</u> The student will question and evaluate short-term gains to environmental losses.	I. Student-Centered in class activity A. Related class and community activities. 1. In a class discussion, set dollar values on the cost of discarding of cars, bottles, can, garbage, etc. (Estimate using decimal fractions) 2. Are there economic gains which bring about environmental losses with respect to trash on the city and country lands? 3. Is it worth the cost of removing cans and cars at public expense to have desirable environmental conditions? 4. Reports of computations made in the various activities
<u>Skills to be Learned:</u> Gathering Data Reporting Comparing	

term economic gains may Discipline Area Mathematics
 long-term environment- Subject Decimal Fractions
 es. Problem Orientation Short-Long term Grade 6 -
 factors

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
The student will y decimal fractions value of environ- n-up. The student will d evaluate short- to environmental	I. Student-Centered in class activity A. Related class and community activities. 1. In a class discussion, set dollar values on the cost of discarding of cars, bottles, can, garbage, etc. (Estimate using decimal fractions). 2. Are there economic gains which bring about environmental losses with respect to trash on the city and country lands? 3. Is it worth the cost of removing cans and cars at public expense to have desirable environmental conditions? 4. Reports of computations made in the various activities	II. ~~Outside~~ Resource and Community Activities A. Class visit to the County Highway Department to check on the cost of picking up cans and bottles in the ditches. B. Class visit to sanitary department or sanitary land fill site and talk with officials to get cost of disposing of cans or bottles. C. Class visit to County Police Department to find the cost of towing away abandoned cars to junk-yards and finding the net loss in terms of dollars in getting the environ-ment cleaned up. D. After field trips compare the actual costs to the class estimations.
be Learned: Data		

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u> <u>Stewardship - The Land - The Land Owner - The Metropolis, New York Open Space Institute, Inc., 1968</u> <u>Inherit the Earth: Man On An Aging Planet, Dodd, 1966</u> <u>Audio-Visual:</u> #6366 - <u>What's Happening to Our Landscape ?</u>, 20 minutes, color \$2, BAVI #6878 - <u>Land Betrayed</u>, 10 minutes, color, \$3.75, BAVI <u>Community:</u> County Highway Department Sanitation Department County Police Department	

ence Materials

Continued and Additional Suggested Learning Experiences

nd - The Land
is, New York
Inc., 1968
ian On An Aging

ning to Our
utes, color

d, 10 minutes,

ement
ment

II. Individual acts, duplicated
or compounded, produce significant
environmental alterations over
time.

Discipline Area Mathematics
 Subject Estimation
 Problem Orientation Individual Ability

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
<u>Cognitive:</u> The student will explain data presented in graphs and construct graphs to summarize data. <u>Affective:</u> The student will pick up litter on the school facilities and place it in a proper container.	I. Student-Centered in class activity After outside activity A. Write the estimates on the chalkboard and have children make bar or line graphs or pictographs to show the incidence of certain types of litter on the playground 1. How much of it was biodegradable? 2. Can they imagine the amounts of litter on all of the playground in the community? in the state? in the country? in the world? 3. Can some of the types of litter be called pollutants? What kinds? B. Have children collect litter in their yards on their block, estimate the incidence of certain
<u>Skills to be Learned:</u> Estimating Graphing Problem Solving Drawing Conclusions	(continued on reverse side)

acts, duplicated _____ Discipline Area Mathematics
 produce significant _____ Subject Estimation - Graphs
 alterations over _____ Problem Orientation Individual Responsi- Grade 6
 _____ bility/Solid Waste Disposal

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
the student will be presented in instruct graphs data. the student will r on the school d place it in a ner.	I. Student-Centered in class activity After outside activity: A. Write the estimates on the chalkboard and have children make bar or line graphs or pictographs to show the incidence of certain types of litter on the playground. 1. How much of it was biodegradable? 2. Can they imagine the amounts of litter on all of the playgrounds in the community? in the state? in the country? in the world? 3. Can some of the types of litter be called pollutants? What Kinds? B. Have children collect the litter in their yards or on their block, estimate the incidence of certain	II. Outside Resource and Community Activities A. Take a "litter walk" around the school playground. Give each group a large bag and designate areas to be covered. Give one child a separate bag and a large magnet to "sweep" the area and probe into sidewalk or asphalt cracks for metals. B. Still outdoors have the children empty the bags and sort the contents. Estimate the number of pieces of paper, bottles, string, etc., and record the estimates. C. Re-collect the litter and dispose of it.
<u>Learned:</u> ng usions		

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested Reading
<u>Publications:</u> Benarde, Melvin A., <u>Our Precious Habitat</u>, W. W. Norton and Co., 55 Fifth Ave., N.Y., N.Y. 10003 \$2.95 paperback \$6.95 hardcover <u>Audio-Visual:</u> Film Strip: <u>Beer Can By The Highway</u> (sound tape) Warren Schloat Productions, Inc., West Nyack, N.Y. 10994 <u>Community:</u> City or County Street and Highway Department	I. (continued) types and prepare graphs to compare done for the school grounds.

<u>Materials</u>	<u>Continued and Additional Suggested Learning Experiences</u>
precious Co., 10003	I. (continued) types and prepare graphs to compare with those done for the school grounds.
e Highway c Produc- Y. 10994	
Highway	

CONCEPT 12. Private ownership must be regarded
as a stewardship and should not
encroach upon or violate the
individual right of others.

Discipline Area Mathemat
 Subject Multipli
 Problem Orientation Snowmo

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
<u>Cognitive:</u> The student will predict the consequences of uncontrolled development of "open spaces" and snowmobile trails. <u>Affective:</u> The student will suggest ways of controlling the development of land used for snowmobiling.	I. Student-Centered in class activity A. See attached sheet and formulate problems for class to work. Examples: 1. What is the minimum number of snowmobiles registered June-1971? 2. What is the maximum number of snowmobiles registered June-1971? B. The average amount spent for snowmobiles in 1970 was \$1,000. 1. What was the total amount of money spent for the minimal number of snowmobiles registered? 2. What was the total amount spent on the maximum number of snowmobiles registered?	II.
<u>Skills to be Learned:</u> Large Number Multiplication Interviewing Drawing Conclusions		

regarded _____ Discipline Area Mathematics
 could not _____ Subject Multiplication
 the _____ Problem Orientation Snowmobiles Grade 6
 rs. _____

SUGGESTED LEARNING EXPERIENCES

will
of
of
pile

will
ing

on

I. Student-Centered in class activity

A. See attached sheet and formulate problems for class to work. Examples:

1. What is the minimum number of snowmobiles registered June-1971?
2. What is the maximum number of snowmobiles registered June-1971?

B. The average amount spent for snowmobiles in 1970 was \$1,000.

1. What was the total amount of money spent for the minimal number of snowmobiles registered?
2. What was the total amount spent on the maximum number of snowmobiles registered?

(continued on reverse side)

II. Outside Resource and Community Activities

A. Have the students write to International Snowmobile Industry Association News Release, 5100 Edina Industrial Blvd., Minneapolis, Minn. 55435, c/o Public Relations Department for the number of snowmobiles registered in the U.S. and the total amount of land available for trails and open spaces.

B. Calculate the number of snowmobiles in their community.

C. Have students go out in pairs and make a neighborhood survey. Example questions:

1. What is good about snowmobiling?
2. Do you think snowmobiles are or could be a

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested Learning Activities
<u>Publications:</u> <u>A Program for Snowmobiling in Wisconsin</u>, DNR, Bureau of Commercial Recreation, Box 405, Madison, Wisconsin 53701 Magazine: <u>National Wildlife</u>, National Wildlife Federation, 534 North Broadway, Milwaukee, Wisconsin 53202, Dec.- Jan. 1972 or I-C-E RMC <u>Audio-Visual:</u> <u>Community:</u> DNR Representative Local Farmers Snowmobile Club County Land Office (Registrar of Deeds)	I. (continued) C. By 1980, \$156,377,370 will be needed to develop land for snowmobiles in Wisconsin to make 421,000 acres for open space trails available for snowmobiling to meet the required needs by 1980, 10,000 acres must be added costing \$38,000,000 of open space must be added costing \$38,000,000 1. What is the average amount per acre for trails? 2. What is the average amount per acre for open space? II. (continued) problem? 3. If they are not now, how about in the future? 4. What kind of restrictions should be placed on snowmobiles? If any, why? D. Report Findings in class. E. Correlate with Social Studies to show the advantages of recreation.

Materials	Continued and Additional Suggested Learning Experiences
in 405, fe, on, kee, n. ar	I. (continued) C. By 1980, \$156,377,370 will be needed to buy and develop land for snowmobiles in Wisconsin. This would make 421,000 acres for open spaces plus many miles of trails available for snowmobiling. In order to meet the required needs by 1980, 10,000 more miles of trails must be added costing \$38,000,000 and 127,000 acres of open space must be added costing \$120,000,000. 1. What is the average amount per mile for additional trails? 2. What is the average amount per acre for additional open space? II. (continued) problem? 3. If they are not now, how about the future? What kind? 4. What kind of restrictions should be placed on snowmobiles? If any, why? D. Report Findings in class. E. Correlate with Social Studies to discuss the advantages of recreation.

$1 - 1,000$
 $1,001 - 2,000$
 $2,001 - 3,000$
 $3,001 - 4,000$
 $4,001 +$





UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
1907

PROJECT I-C-E Episode Evaluation Form (Reproduce or duplicate)

Please fill in:

Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode used in your form. Feel free to adapt it and add more of your critiques and comments - negative and positive. In the right hand column, please rate (poor, good, excellent). Make specific comments or suggestions if you wish to help us make this a more usable form.

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			P. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

T I-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

. Behavioral Objectives

A. Cognitive:

E. Affective:

. Skills Developed

. Suggested Learning Experiences

A. In Class:

B. Outside & Community Activities:

. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, WI 54301

C 9. Man has the ability to manage, Discipline Area Mathematics
 O
 N manipulate, and change his environment. Subject Measurement
 C
 E
 P
 T

ESEA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES

Cognitive: The student will identify and list the effects of varying concentrations of salt on native vegetation.

Affective: The student will realize and appreciate the ability that man has to change and manipulate his environment and recognize the inherent danger of that practice.

Skills to be learned:

Observing
 Recording
 Measuring (dimension and liquid)

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Salt effects on vegetation.

1. The students will construct 4 terrariums (window boxes) and fill them with native vegetation.
2. Maintain the terrariums with equal amounts of water and sunlight for about ten days.
 - a. It will be necessary to measure equal amounts of water, soil, exposure to the sun, and estimate the type and amount of vegetation in each box.

(continued on reverse side)

Area Mathematics

Measurement

Orientation Management of Roads Grade 6
and adjacent lands

SUGGESTED LEARNING EXPERIENCES

-Centered in
Activity

effects on
tation.

The students will
construct 4 ter-
rariums (window
boxes) and fill
them with native
vegetation.
Maintain the
terrariums with
equal amounts of
water and sunlight
for about ten days.
It will be nec-
essary to
measure equal
amounts of
water, soil,
exposure to the
sun, and esti-
mate the type
and amount of
vegetation in
each box.

(on reverse side)

II. Outside Resource and Community Activities

- A. Take a field trip
and observe the amount
and type of vegetation
along a road that is
salted throughout the
winter and one that
received no salt treat-
ment.
- B. Find out how much salt
the county uses on
roads during the month
of February. Calculate
the cost.
- C. Research the effect of
excess amounts of salt
on small game.

Resource and Reference Materials	Continued and Additional Suggested Learning Activities
<u>Publications:</u> <u>Anderson, Edgar, Plants, Man and Life, University of California Berkeley, 1967</u> <u>Dasmann, Raymond F., A Different Kind of Country, Mac Millan, 1968</u> <u>Audio-Visual:</u> <u>Ecology and Man Series - Set #3</u> <u>FS ST11 I-C-E RMC</u> <u>Community:</u> <u>County Department of Highways</u>	I. (continued) 3. Introduce a strong solution of salt into box #1, a weaker solution into boxes #2 and #3, and a very weak solution into box #4. 4. Maintain a salting procedure for ten days and carefully observe the progress of all four boxes. 5. Salt solution must be carefully measured to insure constant dosage. 6. Conduct an experiment showing the effects of salt on ice. Suggest a science or social studies class.

Reference Materials

Continued and Additional Suggested Learning Experiences

Plants, Man and
ty of California

nd F., A Different
Mac Millan, 1968

Series - Set #3
RMC

ent of Highways

I. (continued)

3. Introduce a strong solution of salt water into box #1, a weaker solution into box #2, and no salt into boxes #3 and #4.
4. Maintain a salting procedure for an additional ten days and carefully observe and record the progress of all four boxes.
5. Salt solution must be carefully measured to insure constant dosage.
6. Conduct an experiment showing the physiological effects of salt on ice. Suggest integration with science or social studies classes.

C O N C E P T	10. <u>Short-term economic gains may</u>	Discipline Area <u>Mathematics</u>
	<u>produce long-term environment-</u>	Subject <u>Decimal Fraction</u>
	<u>al losses.</u>	Problem Orientation <u>Short-Long</u> factor
Project I-C-E	BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI
	<u>Cognitive:</u> The student will determine by decimal fractions the dollar value of environmental clean-up. <u>Affective:</u> The student will question and evaluate short-term gains to environmental losses.	I. Student-Centered in class activity A. Related class and community activities. 1. In a class discussion, set dollar values on the cost of discarding of cars, bottles, can, garbage, etc. (Estimate using decimal fractions). 2. Are there economic gains which bring about environmental losses with respect to trash on the city and country lands? 3. Is it worth the cost of removing cans and cars at public expense to have desirable environmental conditions? 4. Reports of computations made in the various activities
	<u>Skills to be Learned:</u> Gathering Data Reporting Comparing	
ESEA Title III - 59-70-0135-2		

mic gains may Discipline Area Mathematics
 m environment- Subject Decimal Fractions
 Problem Orientation Short-Long term Grade 6
 factors

S	SUGGESTED LEARNING EXPERIENCES	
gent will l fractions environ- gent will ce short- onmental	I. Student-Centered in class activity A. Related class and community activities. 1. In a class discussion, set dollar values on the cost of discarding of cars, bottles, can, garbage, etc. (Estimate using decimal fractions). 2. Are there economic gains which bring about environmental losses with respect to trash on the city and country lands? 3. Is it worth the cost of removing cans and cars at public expense to have desirable environmental conditions? 4. Reports of computations made in the various activities	II. Outside Resource and Community Activities A. Class visit to the County Highway Department to check on the cost of picking up cans and bottles in the ditches. B. Class visit to sanitary department or sanitary land fill site and talk with officials to get cost of disposing of cans or bottles. C. Class visit to County Police Department to find the cost of towing away abandoned cars to junkyards and finding the net loss in terms of dollars in getting the environment cleaned up. D. After field trips compare the actual costs to the class estimations.

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u> <u>Stewardship - The Land - The Land Owner - The Metropolis, New York Open Space Institute, Inc., 1968</u> <u>Inherit the Earth: Man On An Aging Planet, Dodd, 1966</u> <u>Audio-Visual:</u> #6366 - <u>What's Happening to Our Landscape ?</u>, 20 minutes, color \$2, BAVI #6878 - <u>Land Betrayed</u>, 10 minutes, color, \$3.75, BAVI <u>Community:</u> County Highway Department Sanitation Department County Police Department	

re Materials

Continued and Additional Suggested Learning Experiences

- The Land
New York
nc., 1968
On An Aging

g to Our
es, color

10 minutes,

nt

t

CONCEPT	II. <u>Individual acts, duplicated</u>	Discipline Area	Mathematics
	<u>or compounded, produce significant</u>	Subject	Estimation - G
	<u>environmental alterations over</u>	Problem Orientation	Individual
	<u>time.</u>		bility/Solid Wa

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENC	
<u>Cognitive:</u> The student will explain data presented in graphs and construct graphs to summarize data. <u>Affective:</u> The student will pick up litter on the school facilities and place it in a proper container.	I. Student-Centered in class activity After outside activity: A. Write the estimates on the chalkboard and have children make bar or line graphs or pictographs to show the incidence of certain types of litter on the playground. 1. How much of it was biodegradable? 2. Can they imagine the amounts of litter on all of the playgrounds in the community? in the state? in the country? in the world? 3. Can some of the types of litter be called pollutants? What Kinds? B. Have children collect the litter in their yards or on their block, estimate the incidence of certain	II. O will O in A graphs will School t in
<u>Skills to be Learned:</u> Estimating Graphing Problem Solving Drawing Conclusions		

(continued on reverse side)

Discipline Area Mathematics
 Subject Estimation - Graphs
 Problem Orientation Individual Responsibility/Solid Waste Disposal Grade 6

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

After outside activity:

A. Write the estimates on the chalkboard and have children make bar or line graphs or pictographs to show the incidence of certain types of litter on the playground.

1. How much of it was biodegradable?
2. Can they imagine the amounts of litter on all of the playgrounds in the community? in the state? in the country? in the world?
3. Can some of the types of litter be called pollutants? What kinds?

B. Have children collect the litter in their yards or on their block, estimate the incidence of certain

II. Outside Resource and Community Activities

A. Take a "litter walk" around the school playground. Give each group a large bag and designate areas to be covered. Give one child a separate bag and a large magnet to "sweep" the area and probe into sidewalk or asphalt cracks for metals.

B. Still outdoors have the children empty the bags and sort the contents. Estimate the number of pieces of paper, bottles, string, etc., and record the estimates.

C. Re-collect the litter and dispose of it.

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u> Benarde, Melvin A., <u>Our Precious Habitat</u>, W. W. Norton and Co., 55 Fifth Ave., N.Y., N.Y. 10003 \$2.95 paperback \$6.95 hardcover <u>Audio-Visual:</u> Film Strip: <u>Beer Can By The Highway</u> (sound tape) Warren Schloat Productions, Inc., West Nyack, N.Y. 10994 <u>Community:</u> City or County Street and Highway Department	I. (continued) types and prepare graphs to compare done for the school grounds.

Reference Materials	Continued and Additional Suggested Learning Experiences
Our Precious n and Co., N.Y. 10003 an By The Highway Schloat Produc- aak, N.Y. 10994 et and Highway	I. (continued) types and prepare graphs to compare with those done for the school grounds.

CONCEPT 12. Private ownership must be regarded
as a stewardship and should not
encroach upon or violate the
individual right of others.

Discipline Area Mathematics
 Subject Multiplication
 Problem Orientation Snowmobiles

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
<u>Cognitive:</u> The student will predict the consequences of uncontrolled development of "open spaces" and snowmobile trails. <u>Affective:</u> The student will suggest ways of controlling the development of land used for snowmobiling. <u>Skills to be Learned:</u> Large Number Multiplication Interviewing Drawing Conclusions	I. Student-Centered in class activity A. See attached sheet and formulate problems for class to work. Examples: 1. What is the minimum number of snowmobiles registered June-1971? 2. What is the maximum number of snowmobiles registered June-1971? B. The average amount spent for snowmobiles in 1970 was \$1,000. 1. What was the total amount of money spent for the minimal number of snowmobiles registered? 2. What was the total amount spent on the maximum number of snowmobiles registered?	II. Outcomes A. H I I R I e P f m U o t B. Ca sn co C. Ha pa ho qu 1. 2.

(continued on reverse side)

(continued)

Discipline Area Mathematics
Subject Multiplication
Problem Orientation Snowmobiles Grade 6

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. See attached sheet and formulate problems for class to work. Examples:

1. What is the minimum number of snowmobiles registered June-1971?
2. What is the maximum number of snowmobiles registered June-1971?

B. The average amount spent for snowmobiles in 1970 was \$1,000.

1. What was the total amount of money spent for the minimal number of snowmobiles registered?
2. What was the total amount spent on the maximum number of snowmobiles registered?

(continued on reverse side)

II. Outside Resource and Community Activities

A. Have the students write to International Snowmobile Industry Association News Release, 5100 Edina Industrial Blvd., Minneapolis, Minn. 55435, c/o Public Relations Department for the number of snowmobiles registered in the U.S. and the total amount of land available for trails and open spaces.

B. Calculate the number of snowmobiles in their community.

C. Have students go out in pairs and make a neighborhood survey. Example questions:

1. What is good about snowmobiling?
2. Do you think snowmobiles are or could be a

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>A Program for Snowmobiling in Wisconsin</u>, DNR, Bureau of Commercial Recreation, Box 405, Madison, Wisconsin 53701 Magazine: <u>National Wildlife</u>, National Wildlife Federation, 534 North Broadway, Milwaukee, Wisconsin 53202, Dec.- Jan. 1972 or I-C-E RMC <u>Audio-Visual:</u> <u>Community:</u> DNR Representative Local Farmers Snowmobile Club County Land Office (Registrar of Deeds)	I. (continued) C. By 1980, \$156,377,370 will be needed to develop land for snowmobiles in Wisconsin. make 421,000 acres for open spaces and trails available for snowmobiling. the required needs by 1980, 10,000 miles must be added costing \$38,000,000 and of open space must be added costing 1. What is the average amount per mile of trails? 2. What is the average amount per acre of open space? II. (continued) problem? 3. If they are not now, how about the kind? 4. What kind of restrictions should snowmobiles? If any, why? D. Report Findings in class. E. Correlate with Social Studies to discuss advantages of recreation.

ls Continued and Additional Suggested Learning Experiences

I. (continued)

C. By 1980, \$156,377,370 will be needed to buy and develop land for snowmobiles in Wisconsin. This would make 421,000 acres for open spaces plus many miles of trails available for snowmobiling. In order to meet the required needs by 1980, 10,000 more miles of trails must be added costing \$38,000,000 and 127,000 acres of open space must be added costing \$120,000,000.

1. What is the average amount per mile for additional trails?
2. What is the average amount per acre for additional open space?

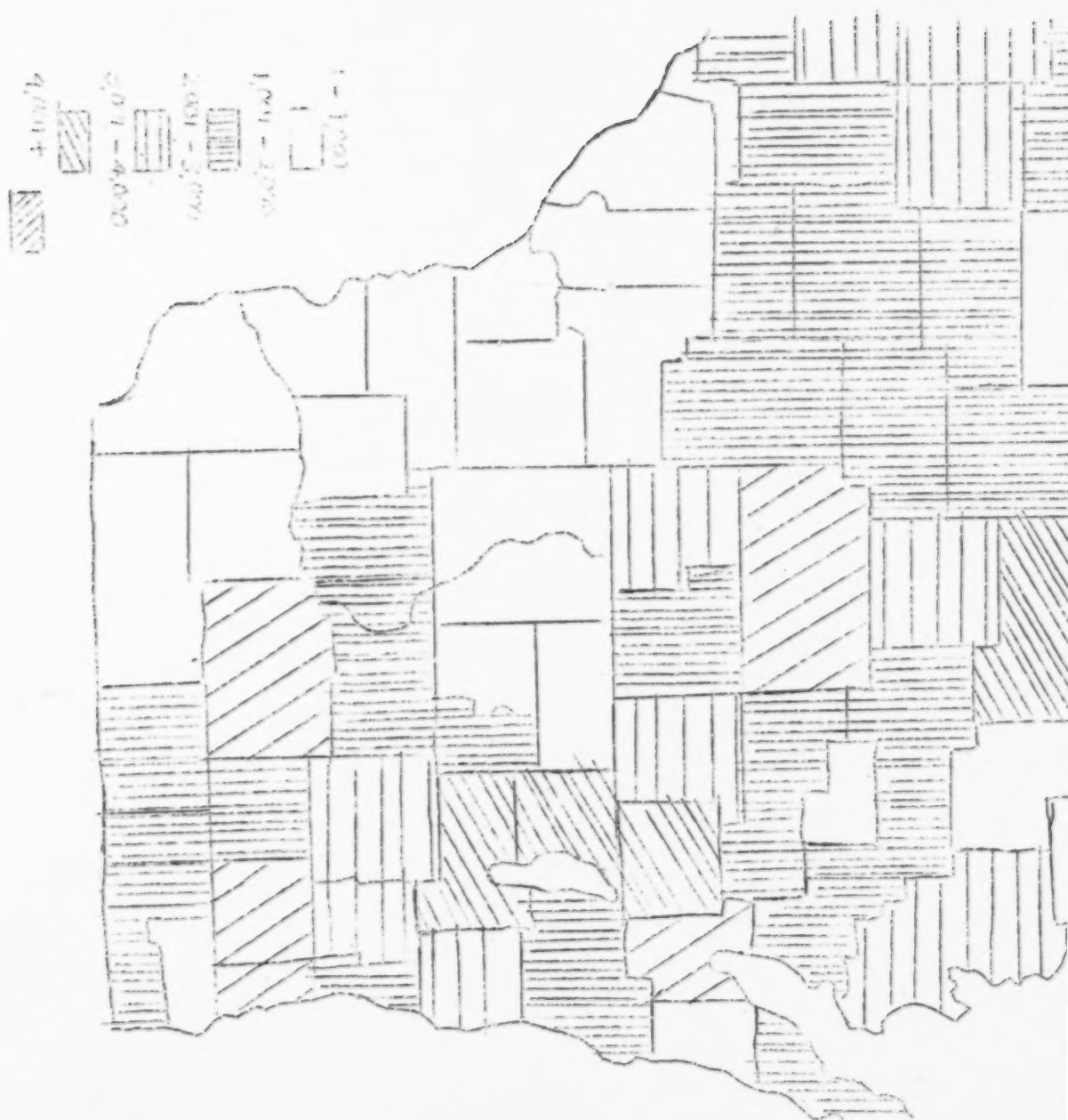
II. (continued)

problem?

3. If they are not now, how about the future? What kind?
4. What kind of restrictions should be placed on snowmobiles? If any, why?

D. Report Findings in class.

E. Correlate with Social Studies to discuss the advantages of recreation.





SHOWING REGISTERED
MAY - 1971

PROJECT I-C-E Episode Evaluation Form (Re

Please fill in:

Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each e
form. Feel free to adapt
your critiques and commen
hand column, please rate
make specific comments or
vided to help us make thi

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Mat (specific suggestions & comments)

ode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-and column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

Objectives
ive:

ve:

eloped

Learning Experiences
s:

& Community Activities:

Resource & Reference Materials
suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, WI 54301